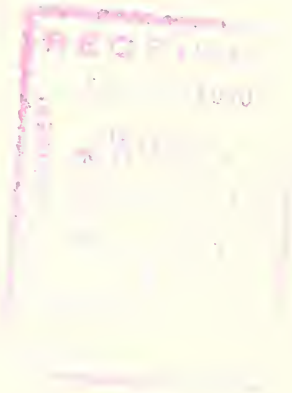
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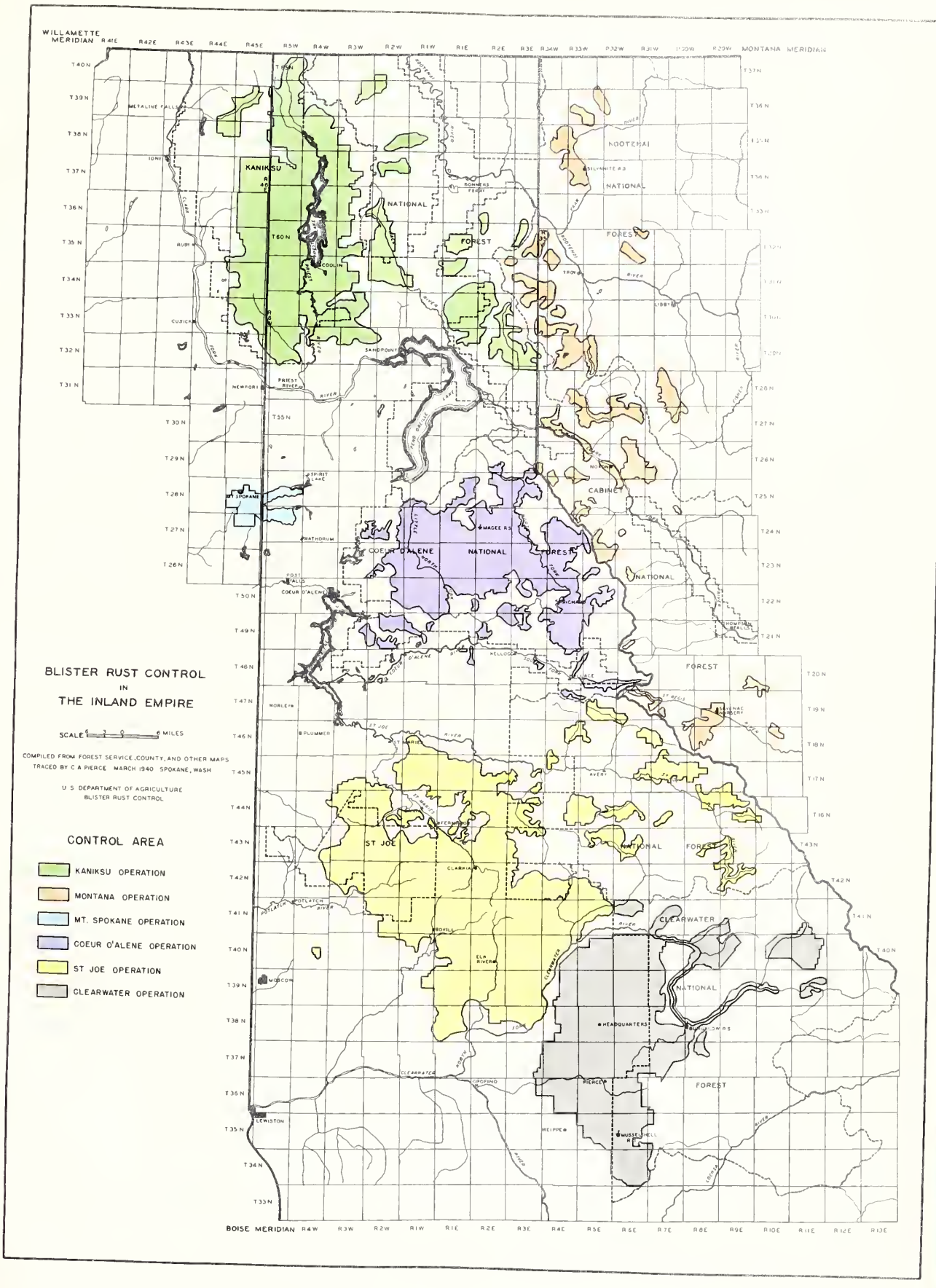
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BLISTER RUST CONTROL
IN
THE INLAND EMPIRE
SCALE 0 3 6 MILES
COMPILED FROM FOREST SERVICE, COUNTY, AND OTHER MAPS
TRACED BY C A PIERCE MARCH 1940 SPOKANE, WASH
U S DEPARTMENT OF AGRICULTURE
BLISTER RUST CONTROL
CONTROL AREA
KANIKSU OPERATION
MONTANA OPERATION
MT. SPOKANE OPERATION
COEUR D'ALENE OPERATION
ST JOE OPERATION
CLEARWATER OPERATION
WILLAMETTE MERIDIAN
MONTANA MERIDIAN
BOISE MERIDIAN
KANIKSU NATIONAL FOREST
KOOTENAI NATIONAL FOREST
COEUR D'ALENE NATIONAL FOREST
CABINET NATIONAL FOREST
ST JOE NATIONAL FOREST
CLEARWATER NATIONAL FOREST
METALINE FALLS
IONE
COLVILLE
SANDPOINT
NEWPORT
PRIEST RIVER
SPIRIT LAKE
ST MARIES
WORLEY
PLUMMER
COEUR D'ALENE
POST FALLS
RATHDRUM
MAGEE RS
KELLOGG
WALLACE
MULLAN
OSBURN
WALLACE
ST REGIS
SAINT REGIS
AVERY
ST MARIES
PRINCETON
CLARKIA
BOVILL
ELK RIVER
MOSCOW
HEADQUARTERS
PIERCE
WEIPPE
MUSSELSHELL
LEWISTON
OROFINO
CLEARWATER
POTLATCH
POTLATCH RIVER
ST JOE
ST MARIES RIVER
COEUR D'ALENE RIVER
NORTH FORK
SOUTH FORK
CLEARWATER RIVER
PEND OREILLE RIVER
KOOTENAI RIVER
CLARK FORK
PRIEST RIVER
PEND OREILLE LAKE
LAKE CREEK
CUSICK
SPOKANE RIVER
LITTLE SPOKANE RIVER
SPOKANE
HOWARD PEAK
SILVERTIP RS
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SUMMARY OF RIBES ERADICATION, 1939
INLAND EMPIRE

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Total Gallons Spray
Open Reproduction	18,930	26,193	4,157	49,280	86,937	15,235,028	
Dense Reproduction	230	2,197	69	2,496	2,607	272,980	
Open Pole	7,688	7,125	706	15,519	14,931	1,917,317	
Dense Pole	373	814	11	1,198	564	27,789	
Open Mature	3,598	4,753	151	8,502	8,420	1,066,575	
Dense Mature	65	365		430	162	12,309	
Cutover	2,656	12,475	3,792	18,923	27,012	6,743,954	
Brush		34	177	211	199	19,064	
Burn		106		106	103	11,422	
Subalpine		9	88	97	44	6,849	
All Upland	33,540	54,071	9,151	96,762	140,979	25,313,287	
Stream (Hand)	1,363	3,353	1,747	6,463	13,127	2,653,577	
Stream (Chemical	333	243	94	670	1,134	95,712	31,904
Stream (Machine)	140			140	1,031	70,000	
Stream (Zone)		17		17	40	4,432	
All Stream	1,503	3,370	1,747	6,620	15,332	2,823,721	
All Types	35,043	57,441	10,898	103,382	156,311	28,137,008	

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Ribes	Gallons Spray
Open Reproduction	18,930	42,342	9,756,798		2.24	515	
Dense Reproduction	230	336	47,548		1.46	207	
Open Pole	7,688	9,620	1,383,168		1.25	180	
Dense Pole	373	167	14,658		.45	39	
Open Mature	3,598	4,116	616,507		1.14	171	
Denee Mature	65	80	5,198		1.23	80	
Cutover	2,656	3,083	776,428		1.16	292	
All Upland	33,540	59,744	12,600,305		1.78	376	
Stream (Hand)	1,363	5,355	1,278,767		3.93	938	
Stream (Chemical)	333	837	73,968	24,656	2.51	222	74
Stream (Machine)	140	1,031	70,000		7.36	500	
All Stream	1,503	7,223	1,422,735		4.81	947	
All Types	35,043	66,967	14,023,040		1.91	400	

TABLE NO. 3B - SECOND WORKING

Open Reproduction	26,193	38,635	4,921,037		1.48	188	
Dense Reproduction	2,197	2,201	196,536		1.00	89	
Open Pole	7,125	4,885	452,994		.69	64	
Dense Pole	814	394	13,106		.48	16	
Open Mature	4,753	4,177	422,700		.88	89	
Dense Mature	365	82	7,111		.22	19	
Cutover	12,475	19,596	5,505,162		1.57	441	
Brush	34	77	2,948		2.26	87	
Burn	106	103	11,422		.97	108	
Subalpine	9	5	1,501		.56	167	
All Upland	54,071	70,155	11,534,517		1.30	213	
Stream (Hand)	3,353	5,699	1,182,299		1.70	353	
Stream (Chemical)	243	266	20,262	6,754	1.09	83	28
Stream (Zone)	17	40	4,432		2.35	261	
All Stream	3,370	6,005	1,206,993		1.78	358	
All Types	57,441	76,160	12,741,510		1.33	222	

TABLE NO. 3C - THIRD WORKING

Open Reproduction	4,157	5,960	557,193		1.43	134	
Dense Reproduction	69	70	28,896		1.01	419	
Open Pole	706	426	81,155		.60	115	
Denee Pole	11	3	25		.27	2	
Open Mature	151	127	27,368		.84	181	
Cutover	3,792	4,333	462,364		1.14	122	
Brush	177	122	16,116		.69	91	
Subalpine	88	39	5,348		.44	61	
All Upland	9,151	11,080	1,178,465		1.21	129	
Stream (Hand)	1,747	2,073	192,511		1.19	110	
Stream (Chemical)	94	31	1,482	494	.33	16	5
All Stream	1,747	2,104	193,993		1.20	111	
All Types	10,898	13,184	1,372,458		1.21	126	

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1939
INLAND EMPIRE

State	Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes
Idaho	First	EQ-ERA	8,824	14,219	4,983,527	9,573	1.61	565
		FS-ERA	3,813	4,625	604,499		1.21	159
		FS-Reg.	8,656	16,485	2,758,555	7,241	1.90	319
		FS-Bulldozer	140	1,031	70,000		7.36	500
		Cooperative	591	1,001	224,999		1.69	381
		F-CCC	5,410	13,976	2,305,739	5,140	2.58	426
		Total	27,434	51,337	10,947,319	21,954	1.87	399
	Second	EQ-ERA	23,164	28,966	4,099,876	1,358	1.25	177
		FS-ERA	3	19	1,040		6.33	347
		FS-Reg.	17,904	23,974	3,481,337	1,495	1.34	194
		Cooperative	3,232	2,622	319,549		.81	99
		F-CCC	7,158	12,113	1,467,930	1,603	1.69	205
		S-CCC	1,835	4,267	2,254,859		2.33	1,229
		Total	53,296	71,966	11,624,591	4,456	1.35	218
	Third	EQ-ERA	4,332	5,366	338,275		1.24	78
		FS-Reg.	2,516	3,291	411,565	494	1.31	164
		Cooperative	324	72	7,092		.22	22
		F-CCC	1,863	2,991	197,610		1.61	106
		Total	9,035	11,720	954,542	494	1.30	106
	All Workings	EQ-ERA	36,320	48,551	9,421,678	10,931	1.34	259
		FS-ERA	3,816	4,644	605,539		1.22	159
		FS-Reg.	29,076	43,750	6,651,457	9,230	1.50	229
		FS-Bulldozer	140	1,031	70,000		7.36	500
		Cooperative	4,147	3,695	551,640		.89	133
		F-CCC	14,431	29,085	3,971,279	6,743	2.02	275
		S-CCC	1,835	4,267	2,254,859		2.33	1,229
		Total	89,765	135,023	23,526,452	26,904	1.50	262
Washington	First	EQ-ERA	407	1,209	358,123		2.97	880
		FS-Reg.	1,651	2,486	841,049		1.51	509
		F-CCC	1,873	4,600	770,401		2.46	411
		Total	3,931	8,295	1,969,573		2.11	501
	Second	EQ-ERA	1,295	1,330	842,269		1.03	650
		FS-Reg.	1,018	685	79,447		.67	78
		F-CCC	815	898	90,184		1.10	111
		Total	3,128	2,913	1,011,900		.93	323
	Third	EQ-ERA	1,863	1,464	417,916		.79	224
	All Workings	EQ-ERA	3,565	4,003	1,618,308		1.12	454
		FS-Reg.	2,669	3,171	920,496		1.19	345
		F-CCC	2,688	5,498	860,585		2.05	320
		Total	8,922	12,672	3,399,389		1.42	381
Montana	First	FS-ERA	1,523	3,008	498,841	250	1.98	328
		FS-Reg.	1,962	3,264	470,293	2,452	1.66	240
		F-CCC	193	1,063	137,014		5.51	710
		Total	3,678	7,335	1,106,148	2,702	1.99	301
	Second	FS-ERA	519	459	34,756	140	.98	67
		FS-Reg.	434	512	50,285	2,158	1.18	116
		F-CCC	64	310	19,978		4.84	312
		Total	1,017	1,281	105,019	2,298	1.26	103
	All Workings	FS-ERA	2,042	3,467	533,597	390	1.70	261
		FS-Reg.	2,396	3,776	520,578	4,610	1.58	217
		F-CCC	257	1,373	156,992		5.34	611
		Total	4,695	8,616	1,211,167	5,000	1.84	258
Total	First	EQ-ERA	9,231	15,428	5,341,650	9,573	1.67	579
		FS-ERA	5,336	7,633	1,103,340	250	1.43	207
		FS-Reg.	12,269	22,235	4,069,897	9,693	1.81	332
		FS-Bulldozer	140	1,031	70,000		7.36	500
		Cooperative	591	1,001	224,999		1.69	381
		F-CCC	7,476	19,639	3,213,154	5,140	2.63	430
		Total	35,043	66,967	14,023,040	24,656	1.91	400
	Second	EQ-ERA	24,459	30,296	4,942,145	1,358	1.24	202
		FS-ERA	522	478	35,796	140	.92	69
		FS-Reg.	19,356	25,171	3,611,069	3,653	1.30	187
		Cooperative	3,232	2,622	319,549		.81	99
		F-CCC	8,037	13,326	1,578,092	1,603	1.66	196
		S-CCC	1,835	4,267	2,254,859		2.33	1,229
		Total	57,441	76,160	12,741,510	6,754	1.33	222
	Third	EQ-ERA	6,195	6,830	756,191		1.10	122
		FS-Reg.	2,516	3,291	411,565	494	1.31	164
		Cooperative	324	72	7,092		.22	22
		F-CCC	1,863	2,991	197,610		1.61	106
		Total	10,898	13,184	1,372,458	494	1.21	126
	All Workings	EQ-ERA	39,885	52,554	11,039,986	10,931	1.32	277
		FS-ERA	5,858	8,111	1,139,136	390	1.38	194
		FS-Reg.	34,141	50,697	8,092,531	13,840	1.48	237
		FS-Bulldozer	140	1,031	70,000		7.36	500
		Cooperative	4,147	3,695	551,640		.89	133
		F-CCC	17,376	35,956	4,988,856	6,743	2.07	287
		S-CCC	1,835	4,267	2,254,859		2.33	1,229
		Total	103,332	156,311	28,137,008	31,904	1.51	272

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1939
INLAND EMPIRE

State	Working	Number of Acres Worked															
		By Forest Service					By Bureau of Entomology and Plant Quarantine					Total					
		Federal					Federal					Federal					
		Forest Service	Public Domain	Total	State	Private	Forest Service	Public Domain	Total	State	Private	Forest Service	Public Domain	Total	State	Private	Total
Idaho	First	14,175	343	14,518	572	2,929	260	150	410	5,461	3,544	14,435	493	14,928	6,033	6,473	27,434
	Second	21,265	510	21,775	428	2,862	3,761	1,690	5,451	10,752	12,028	25,026	2,200	27,226	11,180	14,890	53,296
	Third	4,139		4,139		240	230		230	2,695	1,731	4,369		4,369	2,695	1,971	9,035
	Total	39,579	853	40,432	1,000	6,031	4,251	1,840	6,091	18,908	17,303	43,830	2,693	46,523	19,908	23,334	89,765
Washington	First	2,728		2,728		796	407		407			3,135		3,135		796	3,931
	Second	1,514		1,514		319	46		46	279	970	1,560		1,560	279	1,289	3,128
	Third									1,041	822				1,041	822	1,863
	Total	4,242		4,242		1,115	453		453	1,320	1,792	4,695		4,695	1,320	2,907	8,922
Montana	First	3,397		3,397		281						3,397		3,397		281	3,678
	Second	807		807		210						807		807		210	1,017
	Total	4,204		4,204		491						4,204		4,204		491	4,695
Total	First	20,300	343	20,643	572	4,006	667	150	817	5,461	3,544	20,967	493	21,460	6,033	7,550	35,043
	Second	23,586	510	24,096	428	3,391	3,807	1,690	5,497	11,031	12,998	27,393	2,200	29,593	11,459	16,389	57,441
	Third	4,139		4,139		240	230		230	3,736	2,553	4,369		4,369	3,736	2,793	10,898
	Total	48,025	853	48,878	1,000	7,637	4,704	1,840	6,544	20,228	19,095	52,729	2,693	55,422	21,228	26,732	103,382

TABLE NO. 6

TOTAL RIBES BY SPECIES ERADICATED, 1939
INLAND EMPIRE

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Open Reproduction	18,930	3,300,707	6,433,201	8,900	10,231	3,759		9,756,798
	Dense Reproduction	230	32,943	14,605					47,546
	Open Pole	7,688	569,665	810,499	790	2,214			1,383,168
	Dense Pole	373	2,147	12,511					14,658
	Open Mature	3,598	316,877	252,569	19	7	47,035		616,507
	Dense Mature	65	5,166	32					5,198
	Cutover	2,656	356,900	419,515			13		776,428
	All Upland	33,540	4,584,405	7,942,932	9,709	12,452	50,807		12,600,305
	Stream	1,503	1,059,939	51,546	110,587	200,601	62		1,422,735
	All Types	35,043	5,644,344	7,994,478	120,296	213,053	50,869		14,023,040
Second	Open Reproduction	26,193	1,553,381	3,360,634	2,610	1,926	2,486		4,921,037
	Dense Reproduction	2,197	150,754	45,601		98	83		196,536
	Open Pole	7,125	166,679	260,417	1,347	4,551			452,994
	Dense Pole	814	7,496	5,026	584				13,106
	Open Mature	4,753	265,842	156,263	12	18	565		422,700
	Dense Mature	365	5,835	1,276					7,111
	Cutover	12,475	1,448,615	4,038,395	16,106	108	1,936		5,505,162
	Brush	34	2,948						2,948
	Burn	106	5,306	6,116					11,422
	Subalpine	9	600	901					1,501
	All Upland	54,071	3,627,456	7,874,629	20,661	6,701	5,070		11,534,517
	Stream	3,370	786,448	50,392	90,798	272,656	113	6,586	1,206,993
	All Types	57,441	4,413,904	7,925,021	111,459	279,357	5,183	6,586	12,741,510
Third	Open Reproduction	4,157	289,406	266,104	1,683				557,193
	Dense Reproduction	69	23,526	5,370					28,896
	Open Pole	706	34,088	47,067					81,155
	Dense Pole	11	20	5					25
	Open Mature	151	8,832	18,536					27,368
	Cutover	3,792	395,320	65,040	2,004				462,364
	Brush	177	4,396	11,720					16,116
	Subalpine	88	2,510	2,838					5,348
	All Upland	9,151	756,098	416,680	3,687				1,178,465
	Stream	1,747	103,638	2,689	62,362	22,922		2,382	193,993
	All Types	10,898	861,736	419,369	66,049	22,922		2,382	1,372,458
All Workings	Open Reproduction	49,280	5,143,494	10,059,939	13,193	12,157	6,245		15,235,028
	Dense Reproduction	2,496	207,223	65,576		98	83		272,980
	Open Pole	15,519	790,432	1,117,983	2,137	6,765			1,917,317
	Dense Pole	1,198	9,663	17,542	584				27,789
	Open Mature	8,502	591,551	427,368	31	25	47,600		1,066,575
	Dense Mature	430	11,001	1,308					12,309
	Cutover	18,923	2,200,835	4,522,950	18,112	108	1,949		6,743,954
	Brush	211	7,344	11,720					19,064
	Burn	106	5,306	6,116					11,422
	Subalpine	97	3,110	3,739					6,849
	All Upland	96,762	8,969,959	16,234,241	34,057	19,153	55,877		25,313,287
	Stream	6,620	1,950,025	104,627	263,747	496,179	175	8,968	2,823,721
	All Types	103,382	10,919,984	16,338,868	297,804	515,332	56,052	8,968	28,137,008

SUMMARY OF RIBES ERADICATION, 1923-1939
INLAND EMPIRE

TABLE NO. 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray
Open Reproduction	461,121	74,715	5,111	540,947	662,442	176,523,211	
Dense Reproduction	93,274	7,004	69	100,347	45,492	6,579,499	
Open Pole	267,657	39,270	1,374	308,301	148,154	26,924,813	
Dense Pole	68,983	5,434	115	74,532	16,544	2,566,183	
Open Mature	650,371	37,053	1,605	689,029	320,782	68,802,129	
Dense Mature	67,952	1,952		69,904	8,785	1,187,630	
Cutover	47,704	33,540	4,106	85,350	88,897	27,020,862	
Brush	24,059	2,115	192	26,366	26,147	5,014,195	
Burn	10,135	346		10,481	7,452	3,470,163	
Subalpine	3,255	231	88	3,574	2,351	479,573	
Meadow-Field	2,569	10		2,579	152	12,203	
All Upland	1,697,080	201,670	12,660	1,911,410	1,327,198	318,580,461	
Stream (Hand)	116,079	42,478	9,545	168,102	276,697	66,753,697	
Stream (Chemical)	22,296	8,561	835	31,692	65,937	5,271,452	1,726,279
Stream (Slash)	1,578	53	40	1,671	19,489	1,008,814	
Stream (Machine)	2,150	102		2,252	12,799	1,222,576	
Stream (Zone)	118	3,940		4,058	2,966	430,286	
All Stream	120,320	46,852	9,545	176,717	377,888	74,686,825	
All Types	1,817,400	248,522	22,205	2,088,127	1,705,086	393,267,286	

TABLE NO. 7A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Ribes	Gallons Spray
Open Reproduction	461,121	566,162	163,288,534		1.23	354	
Dense Reproduction	93,274	40,558	6,059,048		.43	65	
Open Pole	267,657	125,671	24,022,281		.47	90	
Dense Pole	68,983	14,494	2,342,350		.21	34	
Open Mature	650,371	297,703	65,732,411		.46	101	
Dense Mature	67,952	8,107	1,114,234		.12	16	
Cutover	47,704	45,735	16,098,173		.96	338	
Brush	24,059	23,931	4,779,621		1.00	199	
Burn	10,135	7,171	3,414,938		.71	337	
Subalpine	3,255	2,170	463,787		.67	142	
Meadow-Field	2,569	151	12,131		.06	5	
All Upland	1,697,080	1,131,853	287,327,508		.67	169	
Stream (Hand)	116,079	210,754	55,525,319		1.82	478	
Stream (Chemical)	22,296	53,187	4,556,020	1,488,405	2.39	204	67
Stream (Slash)	1,578	18,051	971,517		11.44	616	
Stream (Machine)	2,150	12,341	1,176,076		5.74	547	
Stream (Zone)	118	147	15,402		1.25	131	
All Stream	120,320	294,480	62,246,334		2.45	517	
All Types	1,817,400	1,426,333	349,573,842		.79	192	

TABLE NO. 7B - SECOND WORKING

Open Reproduction	74,715	89,013	12,555,951		1.19	168	
Dense Reproduction	7,004	4,864	491,555		.69	70	
Open Pole	39,270	21,343	2,711,978		.54	69	
Dense Pole	5,434	1,972	218,673		.36	40	
Open Mature	37,053	22,261	2,941,369		.60	79	
Dense Mature	1,952	678	73,396		.35	38	
Cutover	33,540	37,834	10,334,307		1.13	308	
Brush	2,115	2,077	218,020		.98	103	
Burn	346	281	55,225		.81	160	
Subalpine	231	142	10,438		.61	45	
Meadow-Field	10	1	72		.10	7	
All Upland	201,670	180,466	29,610,984		.89	147	
Stream (Hand)	42,478	54,179	9,454,712		1.28	223	
Stream (Chemical)	8,561	12,174	673,946	224,712	1.42	79	26
Stream (Slash)	53	796	17,294		15.02	326	
Stream (Machine)	102	458	46,500		4.49	456	
Stream (Zone)	3,940	2,819	414,884		.72	105	
All Stream	46,852	70,426	10,607,336		1.50	226	
All Types	248,522	250,892	40,218,320		1.01	162	

TABLE NO. 7C - THIRD WORKING

Open Reproduction	5,111	7,267	678,726		1.42	133	
Dense Reproduction	69	70	28,896		1.01	419	
Open Pole	1,374	1,140	190,554		.83	139	
Dense Pole	115	78	5,160		.68	45	
Open Mature	1,605	818	128,349		.51	80	
Cutover	4,106	5,328	588,382		1.30	143	
Brush	192	139	16,554		.72	86	
Subalpine	88	39	5,348		.44	61	
All Upland	12,660	14,879	1,641,969		1.18	130	
Stream (Hand)	9,545	11,764	1,773,669		1.23	186	
Stream (Chemical)	835	576	39,486	13,162	.69	47	16
Stream (Slash)	40	642	20,000		16.05	500	
All Stream	9,545	12,982	1,833,155		1.36	192	
All Types	22,205	27,861	3,475,124		1.25	157	

TABLE NO. 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1923-1939
INLAND EMPIRE

State	Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes
Idaho	First	EQ-Reg.	44,572	15,195	3,913,072		.34	88
		FS-Reg.	133,976	144,106	39,054,625	280,205	1.08	292
		EQ-NIRA	61,375	37,916	13,414,672	24,200	.62	219
		FS-NIRA	279,392	160,637	47,282,380	113,170	.59	175
		EQ-ERA	329,165	239,407	62,224,150	128,289	.73	189
		FS-ERA	32,606	32,367	6,606,401		.99	203
		Cooperative	214,834	102,204	30,407,929	339,769	.48	142
		F-CCC	347,988	406,921	82,636,568	311,332	1.17	238
		S&P-CCC	166,813	127,659	26,122,385	234,341	.77	156
		Total	1,601,721	1,269,412	311,662,182	1,431,306	.79	195
	Second	FS-Reg.	53,285	49,434	8,158,856	40,367	.93	153
		EQ-NIRA	2,818	1,888	451,021	3,355	.67	160
		FS-NIRA	16,342	7,262	966,499	8,007	.44	59
		EQ-ERA	82,423	74,385	13,312,777	52,006	.90	162
		FS-ERA	10,533	7,832	950,822	2,044	.74	90
		Cooperative	9,175	6,204	956,312	13,227	.68	104
		F-CCC	39,923	65,014	7,399,018	47,292	1.63	185
		S&P-CCC	14,192	17,763	4,373,993	51,086	1.25	308
		Total	228,691	229,782	36,569,198	217,384	1.01	160
	Third	FS-Reg.	6,462	7,113	1,098,036	2,859	1.10	170
		FS-NIRA	914	747	127,700	1,922	.82	140
		EQ-ERA	5,313	6,673	679,479	3,025	1.26	128
		FS-ERA	284	319	44,201	348	1.12	156
		Cooperative	324	72	7,092		.22	22
		F-CCC	5,064	8,679	927,051	5,008	1.72	183
		S&P-CCC	366	162	17,305		.44	47
		Total	18,717	23,765	2,900,864	13,162	1.27	155
	All Workings	EQ-Reg.	44,572	15,195	3,913,072		.34	88
		FS-Reg.	193,723	200,653	48,311,517	323,431	1.04	249
		EQ-NIRA	64,193	39,804	13,865,693	27,555	.62	216
		FS-NIRA	287,648	168,646	48,376,579	123,099	.59	168
		EQ-ERA	416,901	320,465	76,216,406	183,320	.77	183
		FS-ERA	43,423	40,518	7,601,424	2,392	.93	175
		Cooperative	224,333	108,480	31,371,333	352,996	.48	140
		F-CCC	392,965	480,614	90,962,637	363,632	1.22	231
		S&P-CCC	181,371	145,584	30,513,583	285,427	.80	168
		Total	1,849,129	1,519,959	351,132,244	1,661,852	.82	190
Washington	First	FS-Reg.	2,235	4,723	1,545,525		2.11	692
		EQ-NIRA	26,733	11,711	4,348,258		.44	163
		FS-NIRA	34,417	12,708	3,858,496		.37	112
		EQ-ERA	21,423	35,181	10,074,443		1.64	470
		F-CCC	19,632	21,080	3,216,382		1.07	164
		Total	104,440	85,403	23,043,104		.82	221
	Second	FS-Reg.	1,018	685	79,447		.67	78
		EQ-ERA	10,396	10,759	2,424,027		1.03	233
		FS-ERA	1,949	1,678	154,764		.86	79
		F-CCC	1,897	2,349	157,386		1.24	83
		Total	15,260	15,471	2,815,624		1.01	185
	Third	EQ-ERA	2,101	1,646	452,063		.78	215
	All Workings	FS-Reg.	3,253	5,408	1,624,972		1.66	500
		EQ-NIRA	26,733	11,711	4,348,258		.44	163
		FS-NIRA	34,417	12,708	3,858,496		.37	112
		EQ-ERA	33,920	47,586	12,950,533		1.40	382
		FS-ERA	1,949	1,678	154,764		.86	79
		F-CCC	21,529	23,429	3,373,768		1.09	157
		Total	121,801	102,520	26,310,791		.84	216
Montana	First	EQ-Reg.	1,383	2,315	462,300	30,665	1.67	334
		FS-Reg.	5,535	6,199	1,093,422	2,452	1.12	198
		EQ-NIRA	21,773	8,027	2,158,067		.37	99
		FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211
		EQ-ERA	42,313	20,386	3,292,671	1,330	.48	78
		FS-ERA	6,231	11,401	1,954,076	9,455	1.83	314
		F-CCC	11,789	9,401	1,223,778	2,780	.80	104
		Total	111,239	74,518	14,868,556	57,099	.67	134
	Second	EQ-Reg.	619	980	299,410	4,130	1.58	484
		FS-Reg.	738	773	89,690	2,158	1.05	122
		EQ-ERA	1,342	1,597	266,637		1.19	198
		FS-ERA	1,709	1,900	155,148	1,040	1.11	91
		F-CCC	163	389	23,613		2.39	145
		Total	4,571	5,639	833,498	7,328	1.23	182
	Third	FS-Reg.	739	1,673	63,157		2.26	85
		EQ-ERA	648	777	59,040		1.20	91
		Total	1,387	2,450	122,197		1.77	88
	All Workings	EQ-Reg.	2,002	3,295	761,710	34,795	1.65	380
		FS-Reg.	7,012	8,645	1,246,269	4,610	1.23	178
		EQ-NIRA	21,773	8,027	2,158,067		.37	99
		FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211
		EQ-ERA	44,303	22,760	3,617,348	1,330	.51	82
		FS-ERA	7,940	13,301	2,109,224	10,495	1.68	266
		F-CCC	11,952	9,790	1,247,391	2,780	.82	104
		Total	117,197	82,607	15,824,251	64,427	.70	135
Idaho Washington Montana	First	EQ-Reg.	45,955	17,510	4,375,372	30,665	.38	95
		FS-Reg.	141,746	155,028	41,693,572	282,657	1.09	294
		EQ-NIRA	109,881	57,654	19,920,997	24,200	.52	181
		FS-NIRA	327,024	190,134	55,825,118	123,587	.58	171
		EQ-ERA	392,901	294,974	75,591,264	129,619	.75	192
		FS-ERA	38,837	43,768	8,560,477	9,455	1.13	220
		Cooperative	214,834	102,204	30,407,929	339,769	.48	142
		F-CCC	379,409	437,402	87,076,728	314,112	1.15	230
		S&P-CCC	166,813	127,659	26,122,385	234,341	.77	156
		Total	1,817,400	1,426,333	349,573,842	1,488,405	.78	192
	Second	EQ-Reg.	619	980	299,410	4,130	1.58	484
		FS-Reg.	55,041	50,892	8,327,993	42,525	.92	151
		EQ-NIRA	2,818	1,888	451,021	3,355	.67	160
		FS-NIRA	16,342	7,262	966,499	8,007	.44	59
		EQ-ERA	94,161	86,741	16,002,441	52,006	.92	170
		FS-ERA	14,191	11,410	1,260,734	3,084	.80	89
		Cooperative	9,175	6,204	956,312	13,227	.68	104
		F-CCC	41,983	67,752	7,580,017	47,292	1.61	181
		S&P-CCC	14,192	17,763	4,373,893	51,086	1.25	308
		Total	248,522	250,892	40,218,320	224,712	1.01	162
	Third	FS-Reg.	7,201	8,786	1,161,193	2,859	1.22	161
		FS-NIRA	914	747	127,700	1,922	.82	140
		EQ-ERA	8,062	9,096	1,190,582	3,025	1.12	148
		FS-ERA	284	319	44,201	348	1.12	156
		Cooperative	324	72	7,092		.22	22
		F-CCC	5,064	8,679	927,051	5,008	1.72	183
		S&P-CCC	366	162	17,305		.44	47
		Total	22,205	27,861	3,475,124	13,162	1.25	157
	All Workings	EQ-Reg.	46,574	18,490	4,674,782	34,795	.40	100
		FS-Reg.	203,988	214,706	51,182,758	328,041	1.05	251
		EQ-NIRA	112,699	59,542	20,372,018	27,555	.53	181
		FS-NIRA	344,280	198,143	56,919,317	133,516	.58	165
		EQ-ERA	495,124	390,811	92,784,287	184,650	.79	187
		FS-ERA	53,312	55,497	9,865,412	12,887	1.04	185
		Cooperative	224,333	108,480	31,371,333	352,996	.48	140
		F-CCC	426,446	513,833	95,583,796	366,412	1.20	224
		S&P-CCC	181,371	145,584	30,513,583	285,427	.80	168
		Total	2,088,127	1,705,086	393,267,286	1,726,279	.82	188

TABLE NO. 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1939
INLAND EMPIRE

State	Working	Number of Acres Worked By Ownership Classes					Total
		Federal			State	Private	
		Forest Service	Public Domain	Total			
Idaho	First	844,747	16,312	861,059	257,841	482,821	1,601,721
	Second	123,739	4,509	128,248	32,490	67,953	228,691
	Third	11,097	96	11,193	3,059	4,465	18,717
	Total	979,583	20,917	1,000,500	293,390	555,239	1,849,129
Washington	First	51,925	315	52,240	6,782	45,418	104,440
	Second	4,322	60	4,382	2,943	7,935	15,260
	Third				1,194	907	2,101
	Total	56,247	375	56,622	10,919	54,260	121,801
Montana	First	92,133		92,133	696	18,410	111,239
	Second	3,061		3,061		1,510	4,571
	Third	335		335		1,052	1,387
	Total	95,529		95,529	696	20,972	117,197
Total	First	988,805	16,627	1,005,432	265,319	546,649	1,817,400
	Second	131,122	4,569	135,691	35,433	77,398	248,522
	Third	11,432	96	11,528	4,253	6,424	22,205
	Total	1,131,359	21,292	1,152,651	305,005	630,471	2,088,127

TABLE NO. 10

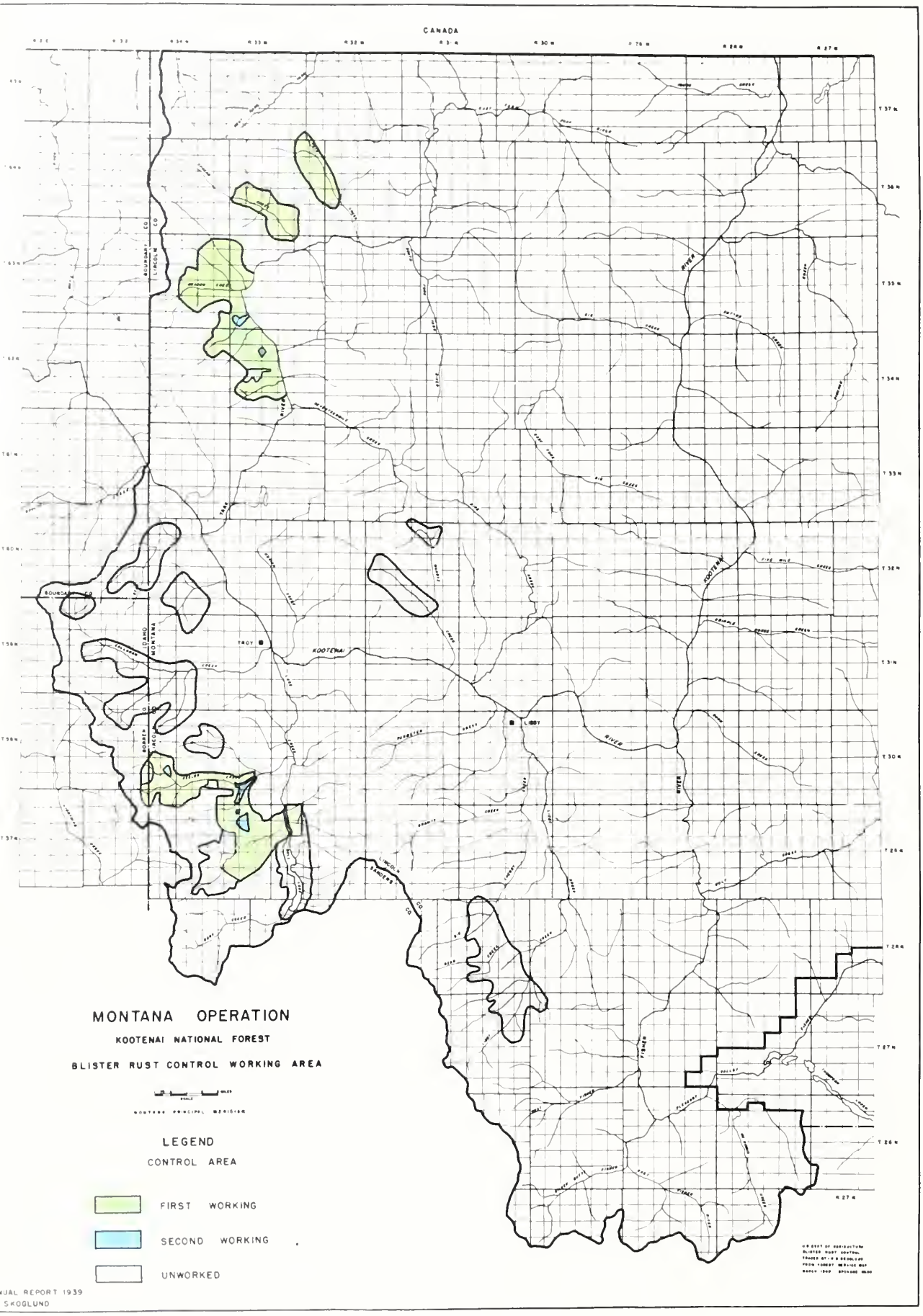
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1939
INLAND EMPIRE

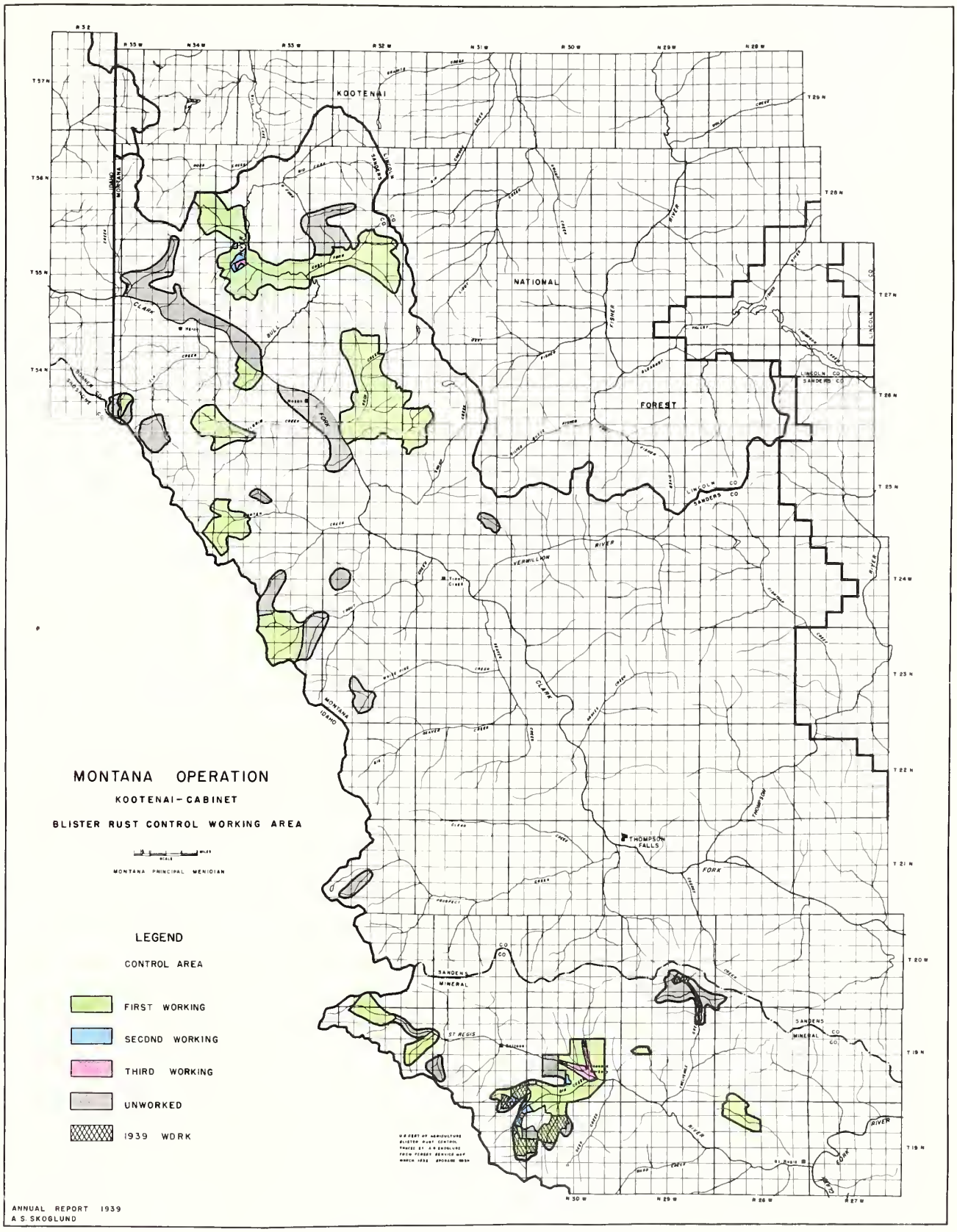
State	Ownership Class	Number of Acres		
		Worked	Unworked	Total
Idaho	Forest Service	844,747	287,488	1,132,235
	Public Domain	16,312	15,438	31,750
	Sub-total Federal	861,059	302,926	1,163,985
	State	257,841	87,034	344,875
	Private	482,821	315,734	798,555
	Total	1,601,721	705,694	2,307,415
Washington	Forest Service	51,925	39,965	91,890
	Public Domain	315		315
	Sub-total Federal	52,240	39,965	92,205
	State	6,782	4,033	10,815
	Private	45,418	13,812	59,230
	Total	104,440	57,810	162,250
Montana	Forest Service	92,133	71,392	163,525
	State	696	234	930
	Private	18,410	17,875	36,285
	Total	111,239	89,501	200,740
Total	Forest Service	988,805	398,845	1,387,650
	Public Domain	16,627	15,438	32,065
	Sub-total Federal	1,005,432	414,283	1,419,715
	State	265,319	91,301	356,620
	Private	546,649	347,421	894,070
	Total	1,817,400	853,005	2,670,405

TABLE NO. 11

TOTAL RIBES BY SPECIES ERADICATED, 1923-1939
INLAND EMPIRE

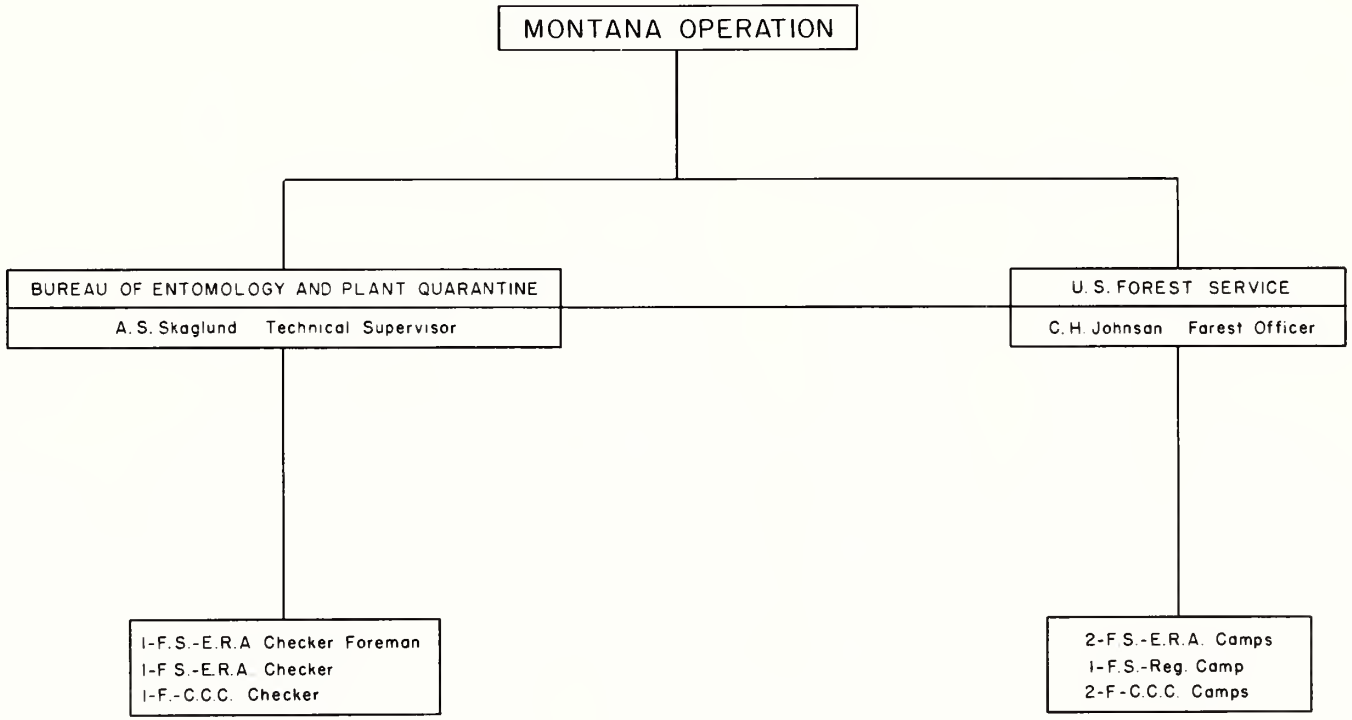
Working	Eradication Type	Acres	Ribes by Species								Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes coloradense	Ribes triste	Ribes acerifolium	
First	Open Reproduction	461,121	42,833,342	118,732,714	180,572	1,071,450	469,311		1,145		163,288,534
	Dense Reproduction	93,274	3,155,566	2,746,056	15,767	104,631	34,813	2,215			6,059,048
	Open Pole	267,657	12,003,829	11,387,942	63,582	341,283	221,269		462	3,914	24,022,281
	Dense Pole	68,983	1,418,796	875,182	1,651	36,301	10,420				2,342,350
	Open Mature	650,371	42,764,722	21,931,457	224,965	363,002	439,143	7,069	26	2,027	65,732,411
	Dense Mature	67,952	818,344	249,393	1,104	42,382	2,839	172			1,114,234
	Cutover	47,704	5,523,148	10,403,808	43,873	88,549	38,795				16,098,173
	Brush	24,059	1,513,695	3,128,718	19,257	97,116	20,835				4,779,621
	Burn	10,135	706,582	2,671,736	8,895	18,433	9,292				3,414,938
	Subalpine	3,255	326,851	136,917		19					463,787
	Meadow-Field	2,569	5,010			7,121					12,131
	All Upland	1,697,080	111,069,885	172,263,923	559,666	2,170,287	1,246,717	9,456	1,633	5,941	287,327,508
	Stream	120,320	40,935,020	1,950,604	6,287,284	12,884,748	116,220	31,619	21,255	19,584	62,246,334
	All Types	1,817,400	152,004,905	174,214,527	6,846,950	15,055,035	1,362,937	41,075	22,888	25,525	349,573,842
Second	Open Reproduction	74,715	4,414,300	8,039,211	35,601	47,927	18,912				12,555,951
	Dense Reproduction	7,004	341,840	148,001	4	1,627	83				491,555
	Open Pole	39,270	1,404,894	1,269,178	17,777	18,393	1,736				2,711,978
	Denee Pole	5,434	171,141	40,811	3,960	2,761					218,673
	Open Mature	37,053	1,620,957	1,280,347	15,811	14,440	9,547		267		2,941,369
	Dense Mature	1,952	59,675	12,838		658	225				73,396
	Cutover	33,540	2,630,005	7,625,055	47,000	21,777	10,470				10,334,307
	Brush	2,115	68,047	149,098		875					218,020
	Burn	346	21,654	28,124	5,447						55,225
	Subalpine	231	5,431	5,007							10,438
	Meadow-Field	10	72								72
	All Upland	201,670	10,738,016	18,597,670	125,600	108,458	40,973		267		29,610,984
	Stream	46,852	5,948,896	737,717	1,883,915	1,857,150	31,511		148,147		10,607,336
	All Types	248,522	16,686,912	19,335,387	2,009,515	1,965,608	72,484		148,414		40,218,320
Third	Open Reproduction	5,111	374,018	302,825	1,683		200				678,726
	Dense Reproduction	69	23,526	5,370							28,896
	Open Pole	1,374	127,359	63,189			6				190,554
	Dense Pole	115	5,095	65							5,160
	Open Mature	1,605	95,669	32,680							128,349
	Cutover	4,106	484,281	102,097	2,004						588,382
	Brush	192	4,536	12,018							16,554
	Subalpine	88	2,510	2,838							5,348
	All Upland	12,660	1,116,994	521,082	3,687		206				1,641,969
	Stream	9,545	867,551	26,283	494,345	442,594			2,382		1,833,155
	All Types	22,205	1,984,545	547,365	498,032	442,594	206		2,382		3,475,124
All Workings	Open Reproduction	540,947	47,621,660	127,074,750	217,856	1,119,377	488,423		1,145		176,526,211
	Denee Reproduction	100,347	3,520,932	2,899,427	15,771	106,258	34,896	2,215			6,579,499
	Open Pole	308,301	13,536,082	12,720,309	81,359	359,676	223,011		462	3,914	26,924,813
	Denee Pole	74,532	1,595,032	916,058	5,611	39,062	10,420				2,566,183
	Open Mature	689,029	44,481,348	23,244,484	240,776	377,442	448,690	7,069	293	2,027	68,802,129
	Dense Mature	69,904	878,019	262,231	1,104	43,040	3,064	172			1,187,630
	Cutover	85,350	8,637,434	18,130,960	92,877	110,326	49,265				27,020,862
	Brush	26,366	1,586,278	3,289,934	19,257	97,991	20,835				5,014,195
	Burn	10,481	728,236	2,699,860	14,342	18,433	9,292				3,470,163
	Subalpine	3,574	334,792	144,762		19					479,573
	Meadow-Field	2,579	5,082			7,121					12,203
	All Upland	1,911,410	122,924,895	191,382,675	688,953	2,278,745	1,287,896	9,456	1,900	5,941	318,580,461
	Stream	176,717	47,751,467	2,714,604	8,665,544	15,184,492	147,731	31,619	171,784	19,584	74,686,825
	All Typee	2,088,127	170,676,362	194,097,279	9,354,497	17,463,237	1,435,627	41,075	173,684	25,525	393,267,286


CANADA
BOUNDARY CO
LINCOLN CO
IDAHO
MONTANA
TROY
KOOTENAI
LIBBY
RIVER
FISHER
MONTANA OPERATION
KOOTENAI NATIONAL FOREST
BLISTER RUST CONTROL WORKING AREA
MONTANA PRINCIPAL MERIDIAN
LEGEND
CONTROL AREA
FIRST WORKING
SECOND WORKING
UNWORKED



ANNUAL REPORT 1939
A.S. SKOGLUND

ORGANIZATION CHART



F. S.-E. R. A.
Number of Camps - 2
Number of Men - 100

F. S.-REG.
Number of Camps - 1
Number of Men — 50

F.-C. C. C.
Number of Camps-2
Number af Men — 85

Total Number of Men on Blister Rust Work — 235

SUMMARY OF RIBES ERADICATION, 1939
MONTANA OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Forest	Eradication Type	Acres First Working	Acres Second Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
								Bushes	Live Stem
Cabinet	Open Reproduction	1,913	344	2,257	5,935	835,856		16.9	29.4
	Open Pole	530		530	577	95,870		5.5	14.7
	Open Mature	882		882	423	57,695		4.5	34.1
	All Upland	3,325	344	3,669	6,935	989,421		12.8	28.9
	Stream (Hand)	102	376	478	1,356	200,296			
	Stream (Chemical)	45	66	111	203	14,589	4,863		
	All Stream	102	376	478	1,559	214,885		21.2	43.7
	All Types	3,427	720	4,147	8,494	1,204,306		14.5	32.2
Savenac Nursery	Open Reproduction	152		152	1	39			
	Stream (Hand)	99	297	396	116	6,411			
	Stream (Chemical)	2		2	5	411	137		
	All Stream	99	297	396	121	6,822		.7	2.1
	All Types	251	297	548	122	6,861		.7	1.9
All Forests	Open Reproduction	2,065	344	2,409	5,936	835,895		15.7	27.4
	Open Pole	530		530	577	95,870		5.5	14.7
	Open Mature	882		882	423	57,695		4.5	34.1
	All Upland	3,477	344	3,821	6,936	989,460		12.2	27.9
	Stream (Hand)	201	673	874	1,472	206,707			
	Stream (Chemical)	47	66	113	208	15,000	5,000		
	All Stream	201	673	874	1,680	221,707		8.2	17.1
	All Types	3,678	1,017	4,695	8,616	1,211,167		10.5	23.5

TABLE NO. 3A - FIRST WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Cabinet	Open Reproduction	1,913	5,415	796,458		2.83	416		15.2	39.5
	Open Pole	530	577	95,870		1.09	181		5.5	14.7
	Open Mature	882	423	57,695		.48	65		4.5	34.1
	All Upland	3,325	6,415	950,023		1.93	286		11.3	35.7
	Stream (Hand)	102	776	147,255		7.61	1,444			
	Stream (Chemical)	45	132	7,695	2,565	2.93	171	57		
	All Stream	102	908	154,950		8.90	1,519		33.4	72.6
	All Types	3,427	7,323	1,104,973		2.14	322		14.2	40.4
Savenac Nursery	Open Reproduction	152	1	39		.01	1			
	Stream (Hand)	99	6	725		.06	7			
	Stream (Chemical)	2	5	411	137	2.50	206	69		
	All Stream	99	11	1,136		.11	11		.8	3.2
	All Types	251	12	1,175		.05	5		.5	2.0
All Forests	Open Reproduction	2,065	5,416	796,497		2.62	386		14.0	36.4
	Open Pole	530	577	95,870		1.09	181		5.5	14.7
	Open Mature	882	423	57,695		.48	65		4.5	34.1
	All Upland	3,477	6,416	950,062		1.85	273		10.8	33.7
	Stream (Hand)	201	782	147,980		3.89	736			
	Stream (Chemical)	47	137	8,106	2,702	2.91	172	57		
	All Stream	201	919	156,086		4.57	777		21.2	46.6
	All Types	3,678	7,335	1,106,148		1.99	301		12.7	36.2

TABLE NO. 3B - SECOND WORKING

Cabinet	Open Reproduction	344	520	39,398		1.51	115		30.0	59.5
	Stream (Hand)	376	580	53,041		1.54	141			
	Stream (Chemical)	66	71	6,894	2,298	1.08	104	35		
	All Stream	376	651	59,935		1.73	159		7.6	11.5
	All Types	720	1,171	99,333		1.63	138		16.3	30.1
Savenac Nursery	Stream (Hand)	297	110	5,686		.37	19		.7	1.8
All Forests	Open Reproduction	344	520	39,398		1.51	115		30.0	59.5
	Stream (Hand)	673	690	58,727		1.03	87			
	Stream (Chemical)	66	71	6,894	2,298	1.08	104	35		
	All Stream	673	761	65,621		1.13	98		2.4	4.2
	All Types	1,017	1,281	105,019		1.26	103		6.1	11.6

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1939
MONTANA OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man Days	Ribes	Gallons Per Sprayed Area	Bushes	Live Stem
First	FS-ERA	1,523	3,008	498,841	250	1.98	328	125	14.9	42.2
	FS-Reg.	1,962	3,264	470,293	2,452	1.66	240	54	10.7	34.3
	F-CCC	193	1,063	137,014		5.51	710		7.2	14.7
	Total	3,678	7,335	1,106,148	2,702	1.99	301	57	12.7	36.2
Second	FS-ERA	519	459	34,756	140	.88	67	17	2.7	3.8
	FS-Reg.	434	512	50,285	2,158	1.18	116	37	8.7	17.7
	F-CCC	64	310	19,978		4.84	312		6.4	11.2
	Total	1,017	1,281	105,019	2,298	1.26	103	35	6.1	11.6
All Workings	FS-ERA	2,042	3,467	533,597	390	1.70	261	39	10.9	29.8
	FS-Reg.	2,396	3,776	520,578	4,610	1.58	217	45	10.1	29.6
	F-CCC	257	1,373	156,992		5.34	611		6.7	12.3
	Total	4,695	8,616	1,211,167	5,000	1.84	258	44	10.5	23.5

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1939
MONTANA OPERATION

Forest	Working	Number of Acres Worked by Forest Service		
		Forest Service	Private	Total
Cabinet	First	3,277	150	3,427
	Second	700	20	720
	Total	3,977	170	4,147
Savenac Nursery	First	120	131	251
	Second	107	190	297
	Total	227	321	548
All Forests	First	3,397	281	3,678
	Second	807	210	1,017
	Total	4,204	491	4,695

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1939
MONTANA OPERATION

Forest	Eradication Type	Average Results for All Areas				Areas with More Than 25 Feet Live Stem Per Acre		
		Acres in Checked Area	Acres Checked	Ribes per Acre			Ribes per Acre	
				Bushes	Live Stem	Acres	Bushes	Live Stem
Cabinet	Open Reproduction	2,090	80.54	16.9	29.4	896	29.6	80.1
	Open Pole	282	10.98	5.5	14.7	48	22.5	66.2
	Open Mature	812	30.86	4.5	34.1	71	22.8	155.0
	All Upland	3,184	122.38	12.8	28.9	1,015	28.8	84.7
	Stream	130	31.76	21.2	43.7	4	39.6	87.1
	All Types	3,314	154.14	14.5	32.2	1,019	29.6	85.1
Savenac Nursery	Open Reproduction	152	6.08					
	Stream	396	56.12	.7	2.1			
	All Types	548	62.20	.7	1.9			
All Forests	Open Reproduction	2,242	86.62	15.7	27.4	896	29.6	80.1
	Open Pole	282	10.98	5.5	14.7	48	22.5	66.2
	Open Mature	812	30.86	4.5	34.1	71	22.8	155.0
	All Upland	3,336	128.46	12.2	27.9	1,015	28.8	84.7
	Stream	526	87.88	8.2	17.1	4	39.6	87.1
	All Types	3,862	216.34	10.5	23.5	1,019	29.6	85.1

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1939
MONTANA OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes triste	
First	Open Reproduction	2,065	459,764	336,665	68			796,497
	Open Pole	530	51,507	44,163	200			95,870
	Open Mature	882	57,141	535	19			57,695
	All Upland	3,477	568,412	381,363	287			950,062
	Stream	201	145,617	880	9,171	418		156,086
	All Types	3,678	714,029	382,243	9,458	418		1,106,148
Second	Open Reproduction	344	21,951	17,447				39,398
	Stream	673	37,226	69	15,219	7,177	5,930	65,621
	All Types	1,017	59,177	17,516	15,219	7,177	5,930	105,019
All Workings	Open Reproduction	2,409	481,715	354,112	68			835,895
	Open Pole	530	51,507	44,163	200			95,870
	Open Mature	882	57,141	535	19			57,695
	All Upland	3,821	590,363	398,810	287			989,460
	Stream	874	182,843	949	24,390	7,595	5,930	221,707
	All Types	4,695	773,206	399,759	24,677	7,595	5,930	1,211,167

SUMMARY OF RIBES ERADICATION, 1928-1939
MONTANA OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Forest	Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray
Kootenai	Open Reproduction	7,985	261		8,246	4,703	731,932	
	Dense Reproduction	2,750	80		2,830	1,008	135,179	
	Open Pole	12,673	779		13,452	7,023	798,307	
	Dense Pole	3,531			3,531	230	15,607	
	Open Mature	7,469			7,469	3,079	433,335	
	Dense Mature	8,328			8,328	457	48,561	
	Brush	107			107	93	7,952	
	Burn	115			115	1	32	
	Meadow-Field	103			103	1		
	All Upland	43,061	1,120		44,181	16,595	2,170,905	
	Stream (Hand)	2,600	533		3,133	7,511	1,170,301	
	All Types	45,661	1,653		47,314	24,106	3,341,206	
Cabinet	Open Reproduction	23,062	813	99	23,974	23,584	4,926,102	
	Dense Reproduction	1,612			1,612	438	71,747	
	Open Pole	17,148	361	38	17,547	8,206	1,504,244	
	Dense Pole	2,619	153	12	2,784	966	211,681	
	Open Mature	7,917			7,917	3,688	946,215	
	Dense Mature	557			557	88	8,566	
	Brush	2,763			2,763	1,895	573,939	
	Meadow-Field	348			348	150	12,131	
	All Upland	56,026	1,327	149	57,502	39,015	8,254,625	
	Stream (Hand)	3,572	525		4,097	10,703	2,762,052	
	Stream (Chemical)	437	78		515	1,258	84,495	28,165
	Stream (Slash)	23			23	215	11,500	
	Stream (Machine)	75			75	644	39,500	
	All Stream	3,670	525		4,195	12,820	2,897,547	
	All Types	59,696	1,852	149	61,697	51,835	11,152,172	
Savenac Nursery	Open Reproduction	4,692	135		4,827	881	365,612	
	Dense Reproduction	102			102	3		
	All Upland	4,794	135		4,929	884	365,612	
	Stream (Hand)	1,088	916	1,238	3,242	4,056	718,960	
	Stream (Chemical)	239	62		301	880	200,801	36,262
	Stream (Slash)	45		40	85	810	42,500	
	Stream (Machine)		15		15	36	3,000	
	All Stream	1,088	931	1,238	3,257	5,782	965,261	
	All Types	5,882	1,066	1,238	8,186	6,666	1,330,873	
All Forests	Open Reproduction	35,739	1,209	99	37,047	29,168	6,023,646	
	Dense Reproduction	4,464	80		4,544	1,449	206,926	
	Open Pole	29,821	1,140	38	30,999	15,229	2,302,551	
	Dense Pole	6,150	153	12	6,315	1,196	227,288	
	Open Mature	15,386			15,386	6,767	1,379,550	
	Dense Mature	8,885			8,885	545	57,127	
	Brush	2,870			2,870	1,988	581,891	
	Burn	115			115	1	32	
	Meadow-Field	451			451	151	12,131	
	All Upland	103,881	2,582	149	106,612	56,494	10,791,142	
	Stream (Hand)	7,260	1,974	1,238	10,472	22,270	4,651,313	
	Stream (Chemical)	676	140		816	2,138	285,296	64,427
	Stream (Slash)	68		40	108	1,025	54,000	
	Stream (Machine)	75	15		90	680	42,500	
	All Stream	7,358	1,989	1,238	10,585	26,113	5,033,109	
	All Types	111,239	4,571	1,387	117,197	82,607	15,824,251	

TABLE NO. 8A - FIRST WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Ribes	Gallons Spray
Kootenai	Open Reproduction	7,986	4,539	706,477		.57	88	
	Dense Reproduction	2,750	1,007	136,112		.37	49	
	Open Pole	12,673	6,416	757,817		.51	60	
	Dense Pole	3,631	230	15,607		.07	4	
	Open Mature	7,469	3,079	433,336		.41	58	
	Denee Mature	8,328	457	48,561		.05	6	
	Brush	107	93	7,952		.87	74	
	Burn	116	1	32		.01	1	
	Meadow-Field	103	1			.01		
	All Upland	43,061	15,823	2,104,893		.37	49	
	Stream (Hand)	2,600	6,706	1,107,426		2.58	426	
	All Types	45,661	22,629	3,212,319		.49	70	
Cabinet	Open Reproduction	23,062	21,784	4,633,537		.94	201	
	Dense Reproduction	1,612	438	71,747		.27	45	
	Open Pole	17,148	7,838	1,470,932		.46	86	
	Denee Pole	2,619	901	208,827		.34	80	
	Open Mature	7,917	3,688	946,215		.47	120	
	Denee Mature	667	88	8,666		.16	16	
	Brush	2,763	1,895	673,939		.69	208	
	Meadow-Field	348	150	12,131		.43	35	
	All Upland	56,026	36,782	7,925,894		.66	141	
	Stream (Hand)	3,572	9,821	2,688,341		2.75	753	
	Stream (Chemical)	437	1,162	74,901	24,967	2.64	171	67
	Stream (Slash)	23	216	11,500		9.35	500	
	Stream (Machine)	75	644	39,500		8.59	527	
	All Stream	3,670	11,832	2,814,242		3.22	767	
	All Types	59,696	48,614	10,740,136		.81	180	
Savenac Nureery	Open Reproduction	4,692	717	332,932		.15	71	
	Dense Reproduction	102	3			.03		
	All Upland	4,794	720	332,932		.15	69	
	Stream (Hand)	1,088	1,710	372,268		1.57	342	
	Stream (Chemical)	239	777	188,401	32,132	3.25	788	134
	Stream (Slash)	45	168	22,500		3.73	500	
	All Stream	1,088	2,655	583,169		2.44	536	
	All Types	5,882	3,376	916,101		.57	156	
All Forests	Open Reproduction	35,739	27,040	5,672,946		.76	159	
	Denee Reproduction	4,464	1,448	206,859		.32	46	
	Open Pole	29,821	14,254	2,228,749		.48	75	
	Denee Pole	6,150	1,131	224,434		.18	36	
	Open Mature	15,386	6,767	1,379,550		.44	90	
	Denee Mature	8,886	545	57,127		.06	6	
	Brush	2,870	1,988	581,891		.69	203	
	Burn	115	1	32		.01	1	
	Meadow-Field	451	151	12,131		.33	27	
	All Upland	103,881	53,326	10,263,719		.51	100	
	Stream (Hand)	7,260	18,237	4,168,035		2.51	574	
	Stream (Chemical)	676	1,929	263,302	57,099	2.85	390	84
	Stream (Slash)	68	383	34,000		5.63	500	
	Stream (Machine)	75	644	39,500		8.59	527	
	All Stream	7,358	21,193	4,504,837		2.88	612	
	All Types	111,239	74,518	14,868,556		.67	134	

TABLE NO. 8B - SECOND WORKING

Kootenai	Open Reproduction	261	164	25,455		.63	98	
	Denee Reproduction	80	1	67		.01	1	
	Open Pole	779	607	40,490		.78	62	
	All Upland	1,120	772	66,012		.69	59	
	Stream (Hand)	533	805	62,875		1.51	118	
	All Types	1,653	1,677	128,887		.95	78	
Cabinet	Open Reproduction	813	1,450	250,230		1.78	308	
	Open Pole	361	273	27,506		.76	76	
	Denee Pole	153	61	2,794		.40	18	
	All Upland	1,327	1,784	280,530		1.34	211	
	Stream (Hand)	525	882	73,711		1.68	140	
	Stream (Chemical)	78	106	9,594	3,198	1.36	123	41
	All Stream	525	988	83,305		1.88	159	
	All Types	1,852	2,772	363,835		1.50	196	
Savenac Nureery	Open Reproduction	135	164	32,680		1.21	242	
	Stream (Hand)	916	987	292,696		1.08	319	
	Stream (Chemical)	62	103	12,400	4,130	1.66	200	67
	Stream (Machine)	15	36	3,000		2.40	200	
	All Stream	931	1,126	308,096		1.21	331	
	All Types	1,066	1,290	340,776		1.21	320	
All Foreets	Open Reproduction	1,209	1,778	308,366		1.47	266	
	Denee Reproduction	80	1	67		.01	1	
	Open Pole	1,140	880	67,996		.77	60	
	Dense Pole	153	61	2,794		.40	18	
	All Upland	2,582	2,720	379,222		1.05	147	
	Stream (Hand)	1,974	2,674	429,282		1.35	217	
	Stream (Chemical)	140	209	21,994	7,328	1.49	167	52
	Stream (Machine)	15	36	3,000		2.40	200	
	All Stream	1,989	2,919	454,276		1.47	228	
	All Types	4,571	5,639	833,498		1.23	182	

TABLE NO. 8C - THIRD WORKING

Cabinet	Open Reproduction	99	350	42,335		3.54	428	
	Open Pole	38	95	5,806		2.50	153	
	Denee Pole	12	4	60		.33	5	
	All Upland	149	449	48,201		3.01	323	
Savenac Nursery	Stream (Hand)	1,238	1,369	63,996		1.10	44	
	Stream (Slash)	40	642	20,000		16.06	500	
	All Stream	1,238	2,001	73,996		1.62	60	
All Foreste	Open Reproduction	99	350	42,336		3.54	428	
	Open Pole	38	95	5,806		2.50	153	
	Denee Pole	12	4	60		.33	6	
	All Upland	149	449	48,201		3.01	323	
	Stream (Hand)	1,238	1,359	53,996		1.10	44	
	Stream (Slash)	40	642	20,000		16.05	500	
	All Stream	1,238	2,001	73,996		1.62	60	
	All Types	1,387	2,450	122,197		1.77	88	

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1928-1939
MONTANA OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis		
						Man Days	Ribes	Gallons per Sprayed Area
First	EQ-Reg.	1,383	2,315	462,300	30,665	1.67	334	148
	FS-Reg.	5,535	6,199	1,093,422	2,452	1.12	198	54
	EQ-NIRA	21,773	8,027	2,158,067		.37	99	
	FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211	40
	EQ-ERA	42,313	20,386	3,292,671	1,330	.48	78	44
	FS-ERA	6,231	11,401	1,954,076	9,455	1.83	314	111
	F-CCC	11,789	9,401	1,223,778	2,780	.80	104	59
	Total	111,239	74,518	14,868,556	57,099	.67	134	84
Second	EQ-Reg.	619	980	299,410	4,130	1.58	484	67
	FS-Reg.	738	773	89,690	2,158	1.05	122	37
	EQ-ERA	1,342	1,597	265,637		1.19	198	
	FS-ERA	1,709	1,900	155,148	1,040	1.11	91	52
	F-CCC	163	389	23,613		2.39	145	
	Total	4,571	5,639	833,498	7,328	1.23	182	52
Third	FS-Reg.	739	1,673	63,157		2.26	85	
	EQ-ERA	648	777	59,040		1.20	91	
	Total	1,387	2,450	122,197		1.77	88	
All Workings	EQ-Reg.	2,002	3,295	761,710	34,795	1.65	380	129
	FS-Reg.	7,012	8,645	1,246,269	4,610	1.23	178	45
	EQ-NIRA	21,773	8,027	2,158,067		.37	99	
	FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211	40
	EQ-ERA	44,303	22,760	3,617,348	1,330	.51	82	44
	FS-ERA	7,940	13,301	2,109,224	10,495	1.68	266	100
	F-CCC	11,952	9,790	1,247,391	2,780	.82	104	59
	Total	117,197	82,607	15,824,251	64,427	.70	135	79

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1928-1939
MONTANA OPERATION

Working	Number of Acres Worked by Ownership Classes			Total
	Forest Service	State - Montana	Private	
First	92,133	696	18,410	111,239
Second	3,061		1,510	4,571
Third	335		1,052	1,387
All Workings	95,529	696	20,972	117,197

TABLE NO. 11

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1928-1939
MONTANA OPERATION

Ownership Class	Number of Acres		
	Worked	Unworked	Total
Forest Service	92,133	71,392	163,525
State - Montana	696	234	930
Private	18,410	17,875	36,285
Total	111,239	89,501	200,740

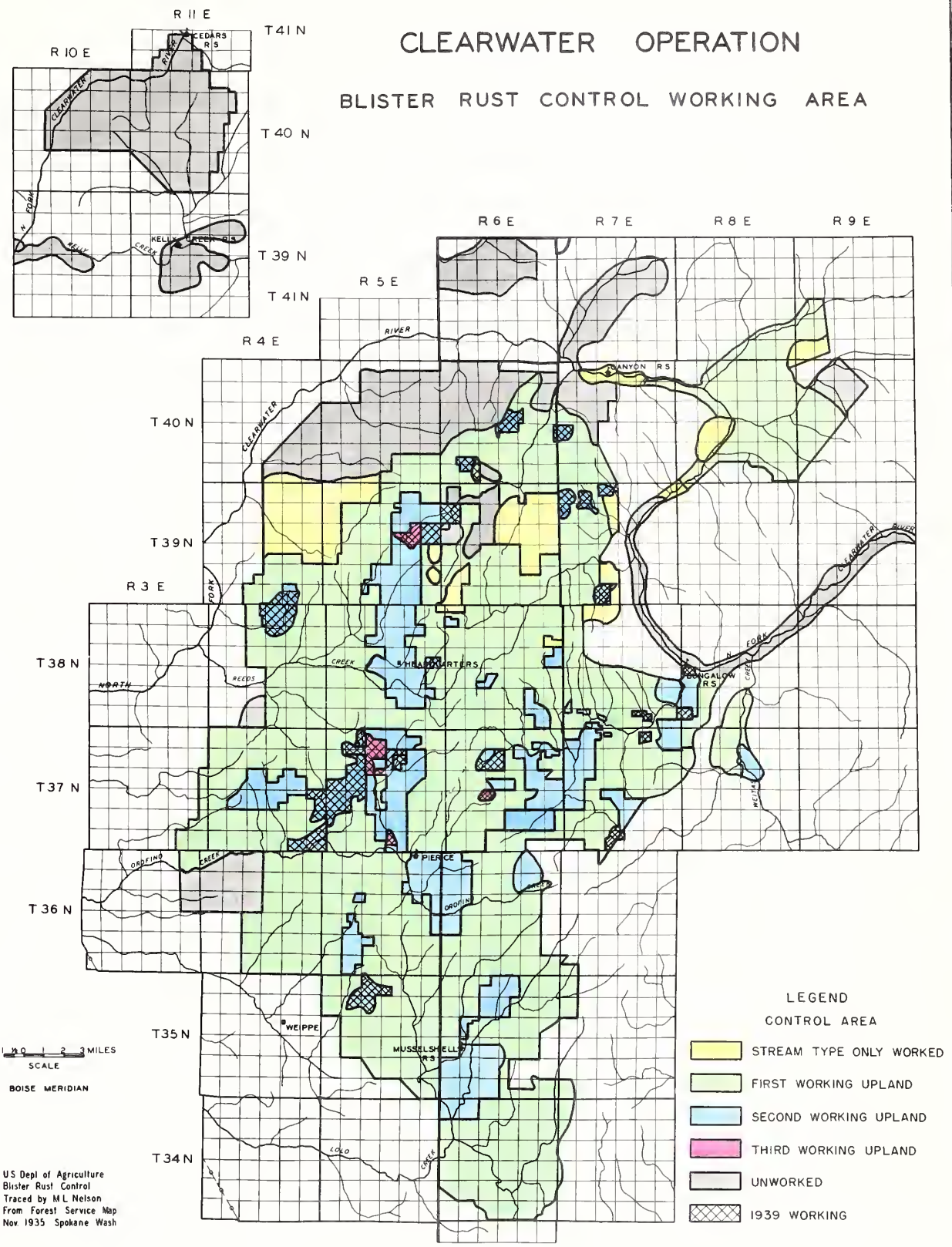
TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1928-1939
MONTANA OPERATION

Working	Eradication Type	Acres	Ribes by Species							Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes coloradense	Ribes triste	
First	Open Reproduction	35,739	2,515,057	2,982,727	4,694	55,569	113,754		1,145	5,672,946
	Dense Reproduction	4,464	142,815	60,781			1,048	2,215		206,859
	Open Pole	29,821	1,236,599	833,155	200	84,642	74,153			2,228,749
	Dense Pole	6,150	130,061	77,785		8,179	8,409			224,434
	Open Mature	15,386	1,181,385	171,268	19	11,080	8,729	7,069		1,379,550
	Dense Mature	8,885	52,148	4,807				172		57,127
	Brush	2,870	285,698	285,771		5,260	5,162			581,891
	Burn	115	32							32
	Meadow-Field	451	5,010			7,121				12,131
	All Upland	103,881	5,548,805	4,416,294	4,913	171,851	211,255	9,456	1,145	10,363,719
	Stream	7,358	2,801,325	110,036	256,093	1,278,897	5,744	31,619	21,123	4,504,837
	All Types	111,239	8,350,130	4,526,330	261,006	1,450,748	216,999	41,075	22,268	14,868,556
Second	Open Reproduction	1,209	75,871	217,353	267	4,650	10,224			308,365
	Dense Reproduction	80	63	4						67
	Open Pole	1,140	42,393	22,576		2,106	921			67,996
	Dense Pole	153	801	1,708		285				2,794
	All Upland	2,582	119,128	241,641	267	7,041	11,145			379,222
	Stream	1,989	87,979	869	34,976	320,156	10,296			454,276
	All Types	4,571	207,107	242,510	35,243	327,197	21,441			833,498
Third	Open Reproduction	99	25,133	17,002			200			42,335
	Open Pole	38	800	5,000			6			5,806
	Dense Pole	12		60						60
	All Upland	149	25,933	22,062			206			48,201
	Stream	1,238	2,318		11,154	60,524				73,996
	All Types	1,387	28,251	22,062	11,154	60,524	206			122,197
All Workings	Open Reproduction	37,047	2,616,061	3,217,082	4,961	60,219	124,178		1,145	6,023,646
	Dense Reproduction	4,544	142,878	60,785			1,048	2,215		206,926
	Open Pole	30,999	1,279,792	860,731	200	86,748	75,080			2,302,551
	Dense Pole	6,315	130,862	79,553		8,464	8,409			227,288
	Open Mature	15,386	1,181,385	171,268	19	11,080	8,729	7,069		1,379,550
	Dense Mature	8,885	52,148	4,807				172		57,127
	Brush	2,870	285,698	285,771		5,260	5,162			581,891
	Burn	115	32							32
	Meadow-Field	451	5,010			7,121				12,131
	All Upland	106,612	5,693,866	4,679,997	5,180	178,892	222,606	9,456	1,145	10,791,142
	Stream	10,585	2,891,622	110,905	302,223	1,659,577	16,040	31,619	21,123	5,033,109
	All Types	117,197	8,585,488	4,790,902	307,403	1,838,469	238,646	41,075	22,268	15,824,251

CLEARWATER OPERATION

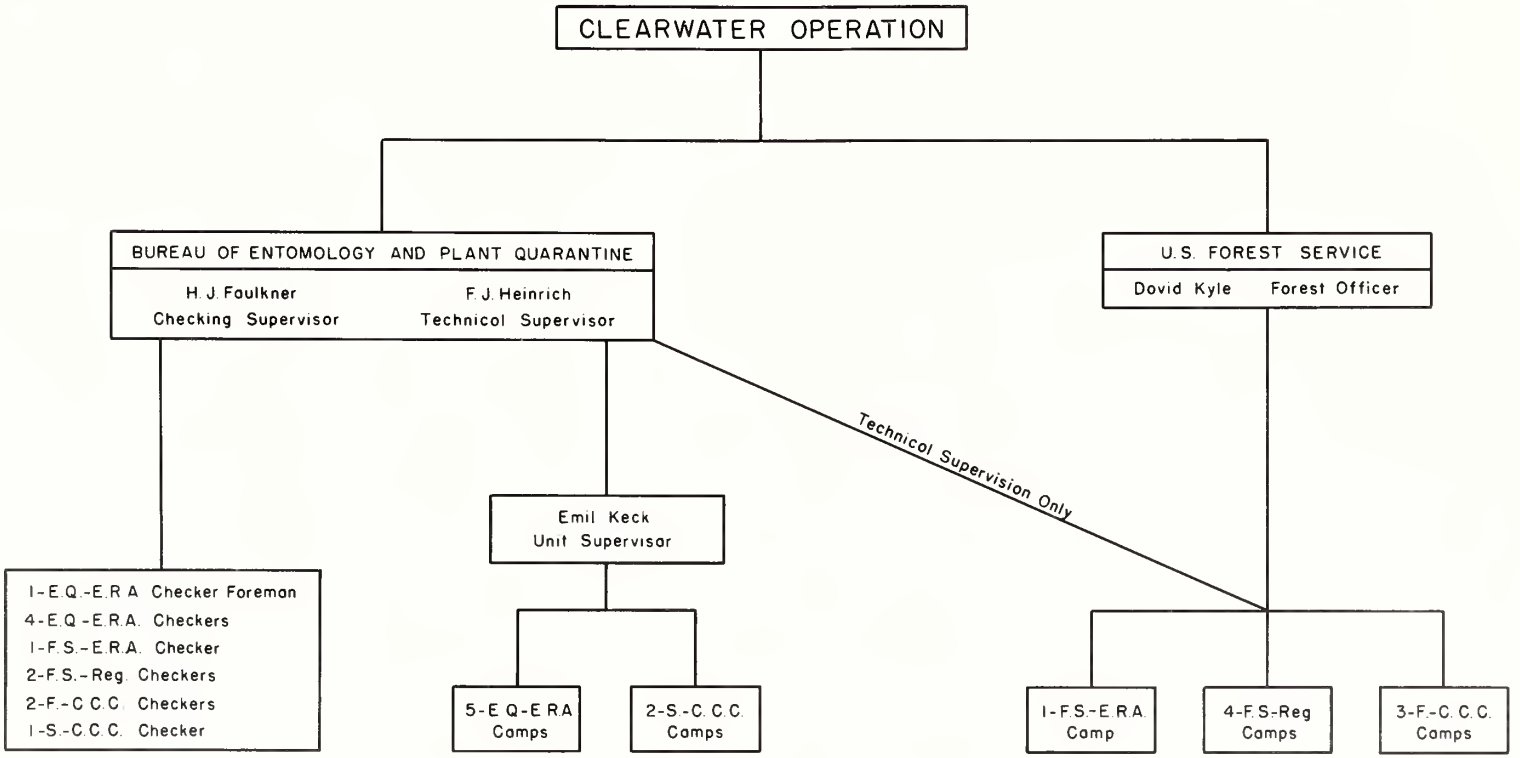
BLISTER RUST CONTROL WORKING AREA



US Dept of Agriculture
Blister Rust Control
Traced by M L Nelson
From Forest Service Map
Nov. 1935 Spokane Wash

ANNUAL REPORT 1939
F J. HEINRICH

ORGANIZATION CHART



E.Q.-E.R.A.
Number of Camps – 5
Number of Men – 350

S.-C.C.C.
Number of Camps – 2
Number of Men – 75

F.S.-E.R.A.
* Number of Camps – 1
Number of Men – 65

F.S.-REG.
Number of Camps – 4
Number of Men – 140

F.-C.C.C.
Number of Camps – 3
Number of Men – 125

Total Number of Men on Blister Rust Work–755

* Discontinued July 1





W 2316-2, 2618. Selective cutaver areas on the Clearwater operation which are heavily grazed, resulting in dwarfed ribes and pralanged ribes germinatian.

SUMMARY OF RIBES ERADICATION, 1939
CLEARWATER OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
								Bushes	Live Stem
Open Reproduction	1,082	4,861	940	6,883	15,297	2,179,734		10.0	19.4
Open Pole		779		779	878	144,484		2.7	7.1
Open Mature	58	527		585	585	77,937		6.3	14.4
Cutover		8,776	1,298	10,074	14,002	3,160,846		9.9	13.9
All Upland	1,140	14,943	2,238	18,321	30,762	5,583,001		9.5	15.7
Stream (Hand)		118		118	195	25,020			
Stream (Chemical)	50	60		110	251	18,177	6,059		
All Stream		118		118	446	43,197			
All Types	1,140	15,061	2,238	18,439	31,208	5,626,198		9.5	15.7

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
					Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Open Reproduction	1,082	3,864	774,965		3.57	716		14.1	34.6
Open Mature	58	74	12,904		1.28	222		4.3	5.0
All Upland	1,140	3,938	787,869		3.45	691		13.2	31.8
Stream (Chemical)	50	111	9,009	3,003	2.22	180	60		
All Types	1,140	4,049	796,878	3,003	3.55	699	60		

TABLE NO. 3B - SECOND WORKING

Open Reproduction	4,861	9,677	1,266,038		1.99	260		8.3	15.8
Open Pole	779	878	144,484		1.12	185		2.7	7.1
Open Mature	527	511	65,033		.96	123		6.5	15.9
Cutover	8,776	13,124	3,138,024		1.49	357		10.5	14.4
All Upland	14,943	24,190	4,613,579		1.61	308		9.2	14.6
Stream (Hand)	118	195	25,020		1.65	212			
Stream (Chemical)	60	140	9,168	3,056	2.33	152	51		
All Stream	118	335	34,188		2.83	289			
All Types	15,061	24,525	4,647,767		1.62	308			

TABLE NO. 3C - THIRD WORKING

Open Reproduction	940	1,756	138,731		1.87	147		15.6	24.7
Cutover	1,298	878	42,822		.67	33		6.0	10.2
All Upland	2,238	2,634	181,553		1.18	81		10.0	16.4
All Types	2,238	2,634	181,553		1.18	81		10.0	16.4

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1939
CLEARWATER OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man Days	Ribes	Gallons Per Sprayed Area	Bushes	Live Stem
First	FS-ERA	353	571	77,375		1.62	219		19.2	43.1
	FS-Reg.	457	2,381	636,750	3,003	5.21	1,393	60	9.4	20.2
	F-CCC	330	1,097	82,753		3.32	250		11.9	35.9
	Total	1,140	4,049	796,878	3,003	3.55	699	60	13.2	31.8
Second	EQ-ERA	8,974	13,276	1,435,213	1,358	1.47	160	27	9.0	14.0
	FS-ERA	3	19	1,040		6.33	347			
	FS-Reg.	2,306	4,779	1,076,968	95	2.07	467	95	8.9	15.4
	F-CCC	2,237	3,239	341,939	1,603	1.44	153	178	8.5	18.1
	S-CCC	1,541	3,212	1,792,607		2.08	1,163		11.3	11.8
	Total	15,061	24,525	4,647,767	3,056	1.63	308	51	9.2	14.6
Third	EQ-ERA	1,788	2,169	133,409		1.21	75		8.0	13.2
	F-CCC	450	465	48,144		1.03	107		17.5	28.2
	Total	2,238	2,634	181,553		1.18	81		10.0	16.4
All Workings	EQ-ERA	10,762	15,445	1,568,622	1,358	1.43	146	27	8.9	13.9
	FS-ERA	356	590	78,415		1.65	220		19.2	43.1
	FS-Reg.	2,763	7,160	1,713,718	3,098	2.59	620	61	9.0	16.3
	F-CCC	3,017	4,801	472,836	1,603	1.59	156	178	10.1	21.1
	S-CCC	1,541	3,212	1,792,607		2.08	1,163		11.3	11.8
	Total	18,439	31,208	5,626,198	6,059	1.69	305	55	9.5	15.7

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1939
CLEARWATER OPERATION

State	Working	Number of Acres Worked								Total
		By Forest Service		By Bureau of Entomology and Plant Quarantine			Total			
		Federal Forest Service	Private	Forest Service	State	Private	Federal Forest Service	State	Private	
Idaho	First	1,100	40				1,100		40	1,140
	Second	4,065	481	513	3,676	6,326	4,578	3,676	6,807	15,061
	Third	450		40	208	1,540	490	208	1,540	2,238
	Total	5,615	521	553	3,884	7,866	6,168	3,884	8,387	18,439

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1939
CLEARWATER OPERATION

Eradication Type	Average Results for All Areas				Areas With More Than 25 Feet Live Stem Per Acre		
	Acres in Checked Area	Acres Checked	Ribes Per Acre		Acres	Ribes Per Acre	
			Bushes	Live Stem		Bushes	Live Stem
Open Reproduction	5,778	214	10.0	19.4	1,587	16.3	35.1
Open Pole	579	23	2.7	7.1			
Open Mature	717	27	6.3	14.4	86	21.5	46.5
Cutover	8,491	300	9.9	13.9	2,339	17.5	27.0
All Upland	15,565	564	9.5	15.7	4,012	17.1	30.5

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1939
CLEARWATER OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	
First	Open Reproduction	1,082	120,282	653,924	759			774,965
	Open Mature	58	5,588	7,316				12,904
	All Upland	1,140	125,870	661,240	759			787,869
	Stream				9,009			9,009
	All Types	1,140	125,870	661,240	9,768			796,878
Second	Open Reproduction	4,861	262,577	1,003,365	96			1,266,038
	Open Pole	779	79,879	63,634	971			144,484
	Open Mature	527	22,276	42,757				65,033
	Cutover	8,776	435,195	2,684,677	16,108	108	1,936	3,138,024
	All Upland	14,943	799,927	3,794,433	17,175	108	1,936	4,613,579
	Stream	118	16,501	5,545	12,142			34,188
	All Types	15,061	816,428	3,799,978	29,317	108	1,936	4,647,767
Third	Open Reproduction	940	107,430	29,618	1,683			138,731
	Cutover	1,298	20,500	20,316	2,004			42,822
	All Upland	2,238	127,930	49,936	3,687			181,553
	All Types	2,238	127,930	49,936	3,687			181,553
All Workings	Open Reproduction	6,883	490,289	1,686,907	2,538			2,179,734
	Open Pole	779	79,879	63,634	971			144,484
	Open Mature	585	27,864	50,073				77,937
	Cutover	10,074	455,695	2,704,995	18,112	108	1,936	3,180,846
	All Upland	18,321	1,053,727	4,505,609	21,621	108	1,936	5,583,001
	Stream	118	16,501	5,545	21,151			43,197
	All Types	18,439	1,070,228	4,511,154	42,772	108	1,936	5,626,198

SUMMARY OF RIBES ERADICATION, 1929-1939
CLEARWATER OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray
Open Reproduction	57,273	12,387	940	70,600	113,241	33,672,427	
Dense Reproduction	11,088	493		11,581	5,286	1,164,891	
Open Pole	25,441	11,284		36,725	21,382	4,527,630	
Dense Pole	3,534	1,569		5,103	1,553	292,973	
Open Mature	213,980	15,743		229,723	107,122	24,099,942	
Dense Mature	5,309	324		5,633	559	134,244	
Cutover	27,726	25,431	1,298	54,455	51,671	17,788,622	
Brush	2,795	79		2,874	2,578	732,633	
Burn	1,045	240		1,285	1,424	961,412	
Subalpine	122			122	118	53,948	
Meadow-Field	1,890			1,890			
All Upland	350,203	67,550	2,238	419,991	305,034	83,428,722	
Stream (Hand)	40,937	21,407	2,174	64,518	61,965	13,907,588	
Stream (Chemical)	14,236	5,507	388	20,131	37,526	2,635,911	878,437
Stream (Slash)	65	13		78	1,258	188,983	
Stream (Zone)		1,666		1,666	1,129	280,094	
All Stream	41,442	23,365	2,174	66,981	101,878	17,012,576	
All Types	391,645	90,915	4,412	486,972	406,912	100,441,298	

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Ribes	Gallons Spray
Open Reproduction	57,273	96,179	31,650,022		1.68	552	
Dense Reproduction	11,088	5,214	1,161,593		.47	105	
Open Pole	25,441	15,201	3,600,567		.60	142	
Dense Pole	3,534	937	185,062		.26	52	
Open Mature	213,980	99,387	23,291,483		.46	109	
Dense Mature	5,309	493	130,871		.09	25	
Cutover	27,726	25,888	10,610,089		.93	383	
Brush	2,795	2,536	729,247		.91	261	
Burn	1,045	1,246	917,609		1.19	878	
Subalpine	122	118	53,948		.97	442	
Meadow-Field	1,890						
All Upland	350,203	247,199	72,330,491		.71	206	
Stream (Hand)	40,937	43,266	11,029,427		1.06	269	
Stream (Chemical)	14,236	29,653	2,287,625	762,275	2.08	160	53
Stream (Slash	65	1,233	188,983		18.97	2,907	
All Stream	41,442	74,152	13,506,035		1.79	326	
All Types	391,645	321,351	85,836,526		.82	219	

TABLE NO. 8B - SECOND WORKING

Open Reproduction	12,387	15,406	1,883,674		1.24	152	
Dense Reproduction	493	72	3,298		.14	7	
Open Pole	11,284	6,181	927,063		.55	82	
Dense Pole	1,569	616	107,911		.39	69	
Open Mature	15,743	7,735	808,459		.49	51	
Dense Mature	324	66	3,373		.20	10	
Cutover	25,431	24,905	7,135,711		.98	280	
Brush	79	42	3,386		.53	43	
Burn	240	178	43,803		.74	183	
All Upland	67,550	55,201	10,916,678		.82	161	
Stream (Hand)	21,407	17,095	2,642,798		.80	123	
Stream (Chemical)	5,507	7,650	339,943	113,381	1.39	62	21
Stream (Slash)	13	25			1.92		
Stream (Zone)	1,666	1,129	280,094		.67	168	
All Stream	23,365	25,899	3,262,835		1.11	140	
All Types	90,915	81,100	14,179,513		.89	156	

TABLE NO. 8C - THIRD WORKING

Open Reproduction	940	1,756	138,731		1.87	147	
Cutover	1,298	878	42,822		.67	33	
All Upland	2,238	2,634	181,553		1.18	81	
Stream (Hand)	2,174	1,604	235,363		.74	108	
Stream (Chemical)	388	223	8,343	2,781	.57	22	7
All Stream	2,174	1,827	243,706		.84	112	
All Types	4,412	4,461	425,259		1.01	96	

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1939
CLEARWATER OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis		
						Man Days	Ribes	Gallons Per Sprayed Area
First	FS-Reg.	10,875	15,649	6,156,620	18,060	1.44	566	72
	EQ-NIRA	19,009	12,345	5,679,694	13,361	.65	299	69
	FS-NIRA	41,460	33,021	12,605,276	11,694	.80	304	79
	EQ-ERA	62,640	60,861	14,881,129	75,622	.97	238	77
	FS-ERA	2,503	3,769	1,427,903		1.50	570	
	Cooperative	91,453	59,665	18,267,124	283,158	.65	200	36
	F-CCC	65,359	59,567	12,732,134	148,629	.91	195	62
	S&P-CCC	98,346	76,474	14,086,646	211,751	.78	143	87
	Total	391,645	321,351	85,836,526	762,275	.82	219	54
Second	FS-Reg.	13,666	8,887	1,658,755	6,936	.65	121	26
	EQ-NIRA	1,076	660	159,890	3,355	.61	149	45
	FS-NIRA	2,498	2,342	175,212	8,007	.93	70	21
	EQ-ERA	41,130	38,116	6,339,452	42,349	.93	154	28
	FS-ERA	8,249	5,184	514,730	2,044	.62	62	27
	Cooperative	4,843	2,898	553,110	10,553	.60	114	3
	F-CCC	10,415	12,155	1,476,068	18,003	1.17	142	41
	S&P-CCC	9,038	10,858	3,302,296	22,134	1.20	365	19
	Total	90,915	81,100	14,179,513	113,381	.89	156	15
Third	FS-Reg.	446	348	31,543		.78	71	
	FS-NIRA	914	747	127,700	1,922	.82	140	30
	EQ-ERA	1,788	2,169	133,409		1.21	75	
	FS-ERA	284	319	44,201	348	1.12	156	3
	F-CCC	683	778	73,959	511	1.14	108	2
	S&P-CCC	297	100	14,447		.34	49	
	Total	4,412	4,461	425,259	2,781	1.01	96	7
All Workings	FS-Reg.	24,987	24,884	7,846,918	24,996	1.00	314	54
	EQ-NIRA	20,085	13,005	5,839,584	16,716	.65	291	64
	FS-NIRA	44,872	36,110	12,908,188	21,623	.80	288	36
	EQ-ERA	105,558	101,146	21,353,990	117,971	.96	202	47
	FS-ERA	11,036	9,272	1,986,834	2,392	.84	180	13
	Cooperative	96,296	62,563	18,820,234	293,711	.65	195	27
	F-CCC	76,457	72,500	14,282,161	167,143	.95	187	55
	S&P-CCC	107,681	87,432	17,403,389	233,885	.81	162	66
	Total	486,972	406,912	100,441,298	878,437	.83	206	41

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1939
CLEARWATER OPERATION

Working	Number of Acres Worked by Ownership Classes					
	Federal			State - Idaho	Private	Total
	Forest Service	Public Domain	Total			
First	146,531	3,680	150,211	78,834	162,600	391,645
Second	40,382	628	41,010	13,223	36,682	90,915
Third	2,238	12	2,250	360	1,802	4,412
All Workings	189,151	4,320	193,471	92,417	201,084	486,972

TABLE NO. 11

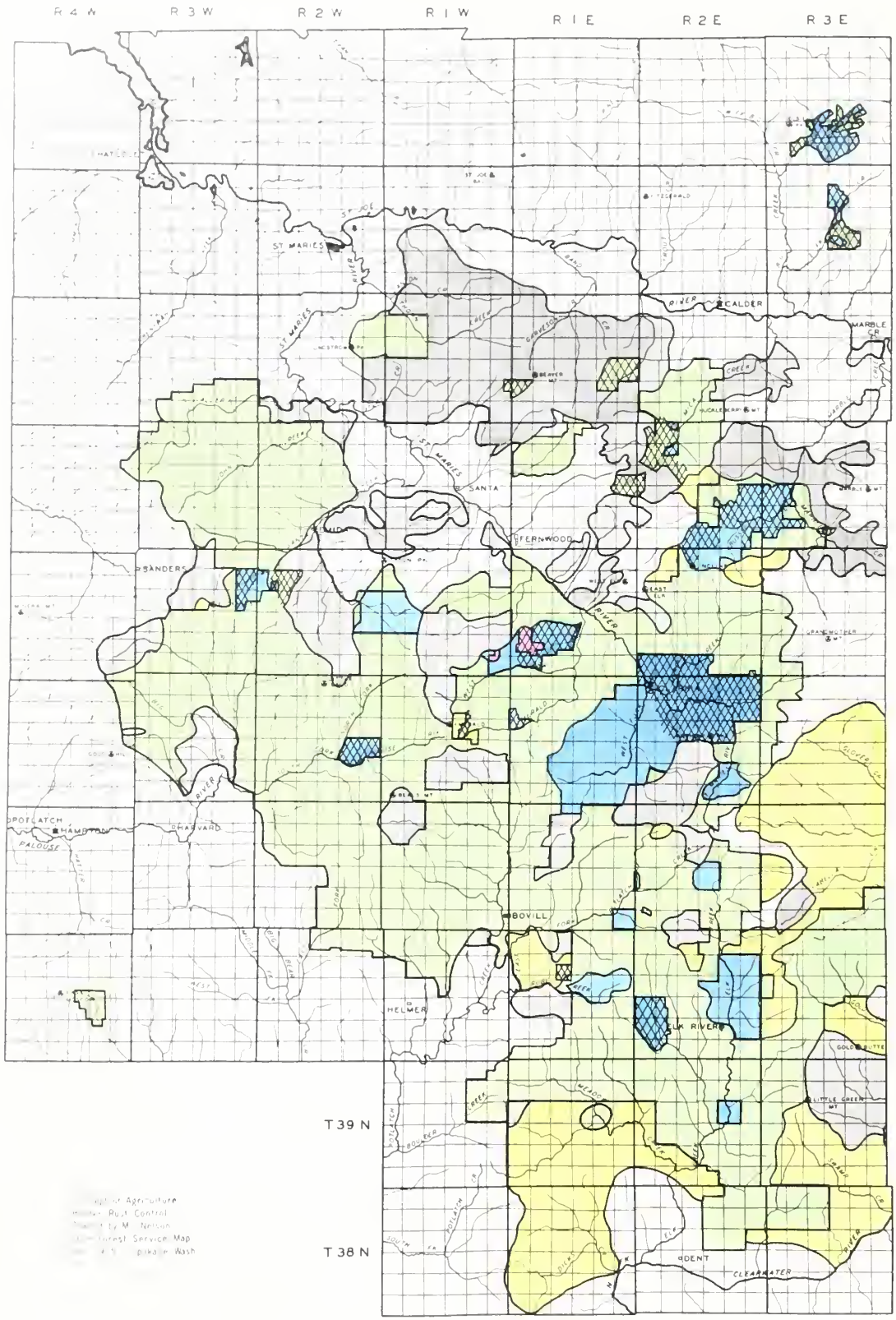
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1939
CLEARWATER OPERATION

Ownership Class	Number of Acres		
	Worked	Unworked	Total
Forest Service	146,531	58,199	204,730
Public Domain	3,680	350	4,030
Sub-total Federal	150,211	58,549	208,760
State	78,834	14,156	92,990
Private	162,600	45,650	208,250
Total	391,645	118,355	510,000

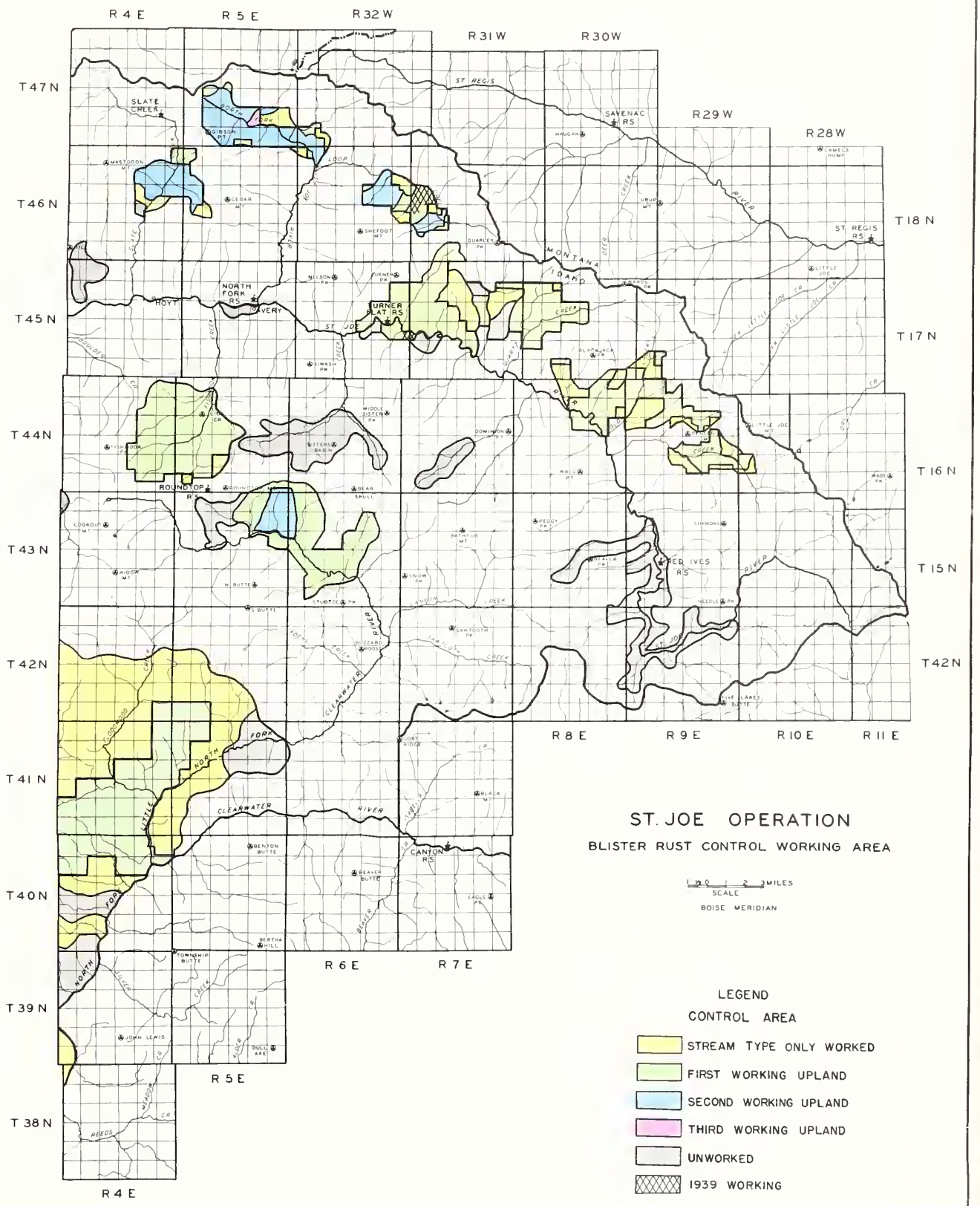
TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1929-1939
CLEARWATER OPERATION

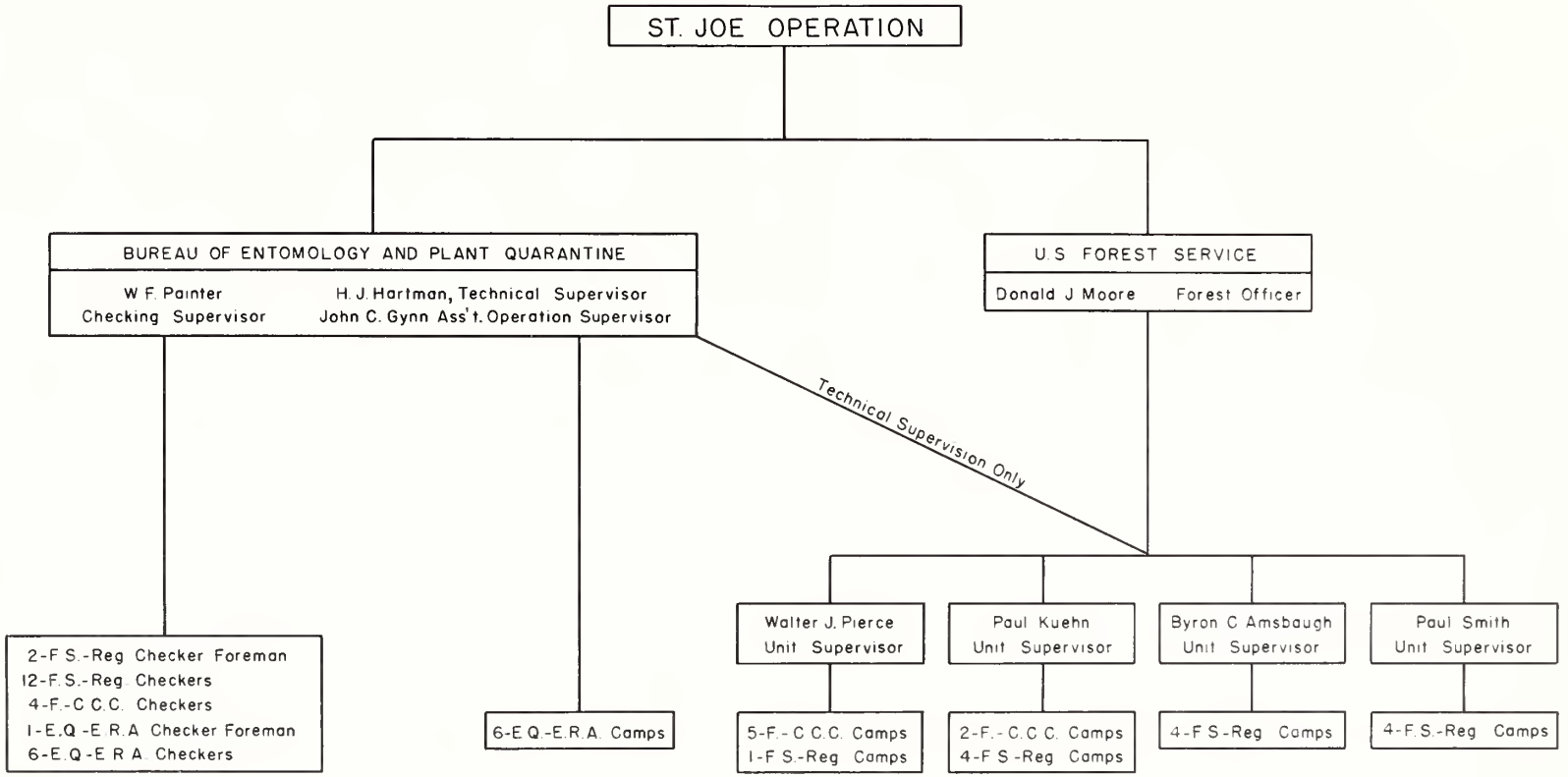
Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Open Reproduction	57,273	7,478,878	23,940,491	73,506	41,600	115,547		31,650,022
	Dense Reproduction	11,088	157,346	980,480	2,457	5,726	15,584		1,161,593
	Open Pole	25,441	2,340,591	1,221,117	31,301	6	7,090	462	3,600,567
	Dense Pole	3,534	127,043	57,703	316				185,062
	Open Mature	213,980	16,156,577	6,773,065	197,117	107,057	57,641	26	23,291,483
	Dense Mature	5,309	104,873	22,438	715	865	1,980		130,871
	Cutover	27,726	2,100,601	8,431,923	38,603	27,752	11,210		10,610,089
	Brush	2,795	210,516	490,931	17,270	114	10,416		729,247
	Burn	1,045	74,796	838,377	568		3,868		917,609
	Subalpine	122	53,500	448					53,948
	Meadow-Field	1,890							
	All Upland	350,203	28,804,721	42,756,973	361,853	183,120	223,336	488	72,330,491
	Stream	41,442	9,784,636	324,255	2,669,916	701,834	25,394		13,506,035
	All Types	391,645	38,589,357	43,081,228	3,031,769	884,954	248,730	488	85,836,526
Second	Open Reproduction	12,387	446,150	1,431,101	6,419	4			1,883,674
	Dense Reproduction	493	102	3,192	4				3,298
	Open Pole	11,284	395,523	518,636	12,653	1	250		927,063
	Dense Pole	1,569	101,801	2,734	3,376				107,911
	Open Mature	15,743	392,150	400,158	15,768	116		267	808,459
	Dense Mature	324	3,058	315					3,373
	Cutover	25,431	971,126	6,110,087	47,000	108	7,390		7,135,711
	Brush	79	424	2,962					3,386
	Burn	240	16,348	22,008	5,447				43,803
	All Upland	67,550	2,326,682	8,491,193	90,667	229	7,640	267	10,916,678
	Stream	23,365	1,856,014	514,396	799,892	76,716	9,141	6,676	3,262,835
	All Types	90,915	4,182,696	9,005,589	890,559	76,945	16,781	6,943	14,179,513
Third	Open Reproduction	940	107,430	29,618	1,683				138,731
	Cutover	1,298	20,500	20,318	2,004				42,822
	All Upland	2,238	127,930	49,936	3,687				181,553
	Stream	2,174	178,214	2,038	40,638	22,816			243,706
	All Types	4,412	306,144	51,974	44,325	22,816			425,259
All Workings	Open Reproduction	70,600	8,032,458	25,401,210	81,608	41,604	115,547		33,672,427
	Dense Reproduction	11,581	157,448	983,672	2,461	5,726	15,584		1,164,891
	Open Pole	36,725	2,736,114	1,739,753	43,954	7	7,340	462	4,527,630
	Dense Pole	5,103	228,844	60,437	3,692				292,973
	Open Mature	229,723	16,548,727	7,173,223	212,885	107,173	57,641	293	24,099,942
	Dense Mature	5,633	107,931	22,753	715	865	1,980		134,244
	Cutover	54,455	3,092,227	14,562,328	87,607	27,860	18,600		17,788,622
	Brush	2,874	210,940	493,893	17,270	114	10,416		732,633
	Burn	1,285	91,144	860,385	6,015		3,868		961,412
	Subalpine	122	53,500	448					53,948
	Meadow-Field	1,890							
	All Upland	419,991	31,259,333	51,298,102	456,207	183,349	230,976	755	83,428,722
	Stream	66,981	11,818,864	840,689	3,510,446	801,366	34,535	6,676	17,012,576
	All Types	486,972	43,078,197	52,138,791	3,966,653	984,715	265,511	7,431	100,441,298



ANNUAL REPORT 1939
H J HARTMAN


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R32W
R31W
R30W
R29W
R28W
T47N
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T44N
T43N
T42N
T41N
T40N
T39N
T38N
T18N
T17N
T16N
T15N
T42N
R 8 E
R 9 E
R10E
R11E
R 6 E
R 7 E
R 5 E
R 4 E
ST. JOE OPERATION
BLISTER RUST CONTROL WORKING AREA
SCALE
BOISE MERIDIAN
LEGEND
CONTROL AREA
STREAM TYPE ONLY WORKED
FIRST WORKING UPLAND
SECOND WORKING UPLAND
THIRD WORKING UPLAND
UNWORKED
1939 WORKING

ORGANIZATION CHART



E.Q.-E.R.A.
Number of Camps - 6
Number of Men - 405

F.-C.C.C.
Number of Camps - 7
Number of Men - 425

F.S.-REG.
Number of Camps - 13
Number of Men - 515

Total Number of Men on Blister Rust Work - 1345



W 1091, 1596. Stands of western white pine open reproduction which are very typical of the major portion of the areas worked in 1939. The coniferous stands have recently become established and represent conditions favorable to the appearance and persistence of ribes.

SUMMARY OF RIBES ERADICATION, 1939
ST. JOE OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
								Bushes	Live Stem
Open Reproduction	9,056	12,439	151	21,646	36,052	5,216,607		10	24
Dense Reproduction	94	1,218		1,312	725	28,751		2	13
Open Pole	321	4,892	280	5,493	3,954	225,690		3	10
Dense Pole		693		693	380	12,319		1	3
Open Mature	983	2,231		3,214	3,374	419,067		6	15
Burn		106		106	103	11,422			
All Upland	10,454	21,579	431	32,464	44,588	5,913,856		8	20
Stream (Rand)	391	1,780	1,340	3,511	6,658	1,627,459		8	13
Stream (Chemical)	236	117	94	447	675	62,535	20,845		
All Stream	391	1,780	1,340	3,511	7,333	1,689,994		8	13
All Types	10,845	23,359	1,771	35,975	51,921	7,603,850		8	18

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
					Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Open Reproduction	9,056	18,482	3,561,555		2.04	393		12	32
Dense Reproduction	94	107	11,556		1.14	123		2	12
Open Pole	321	858	52,441		2.67	163		5	21
Open Mature	983	1,637	245,756		1.67	250		6	33
All Upland	10,454	21,084	3,871,308		2.02	370		11	31
Stream (Hand)	391	1,702	529,257		4.35	1,354		36	73
Stream (Chemical)	236	589	56,853	18,951	2.50	241	80		
All Stream	391	2,291	586,110		5.86	1,499		36	73
All Types	10,845	23,375	4,457,418		2.16	411		13	34
TABLE NO. 3B - SECOND WORKING									
Open Reproduction	12,439	17,320	1,643,868		1.39	132		10	21
Dense Reproduction	1,218	618	17,195		.51	14		2	13
Open Pole	4,892	2,910	163,186		.59	33		3	10
Dense Pole	693	380	12,319		.55	18		1	3
Open Mature	2,231	1,737	173,311		.78	78		6	9
Burn	106	103	11,422		.97	108			
All Upland	21,579	23,068	2,021,301		1.07	94		7	16
Stream (Hand)	1,780	3,567	946,534		2.00	532		9	11
Stream (Chemical)	117	55	4,200	1,400	.47	36	12		
All Stream	1,780	3,622	950,734		2.03	534		9	11
All Types	23,359	26,690	2,972,035		1.14	127		7	15
TABLE NO. 3C - THIRD WORKING									
Open Reproduction	151	250	11,184		1.66	74		2	7
Open Pole	280	186	10,063		.66	36		2	5
All Upland	431	436	21,247		1.01	49		2	6
Stream (Hand)	1,340	1,389	151,668		1.04	113		4	8
Stream (Chemical)	94	31	1,482	494	.33	16	5		
All Stream	1,340	1,420	153,150		1.06	114		4	8
All Types	1,771	1,856	174,397		1.05	98		4	8

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1939
ST. JOE OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man Days	Ribes	Gallons Per Sprayed Area	Bushes	Live Stem
First	EQ-ERA	2,302	4,138	1,338,236	9,573	1.80	581	111	20	46
	FS-Reg.	4,512	9,340	1,551,436	4,238	2.07	344	118	10	25
	F-CCC	4,031	9,897	1,567,746	5,140	2.46	389	45	11	40
	Total	10,845	23,375	4,457,418	18,951	2.16	411	80	13	34
Second	EQ-ERA	12,396	11,710	1,305,132		.94	105		4	10
	FS-Reg.	10,455	14,148	1,610,750	1,400	1.35	154	12	11	20
	F-CCC	508	832	56,153		1.64	111		11	34
	Total	23,359	26,690	2,972,035	1,400	1.14	127	12	7	15
Third	EQ-ERA	853	872	78,345		1.02	92		3	7
	FS-Reg.	918	984	96,052	494	1.07	105	5	10	14
	Total	1,771	1,856	174,397	494	1.05	98	5	4	8
All Workings	EQ-ERA	15,551	16,720	2,721,713	9,573	1.08	175	111	5	13
	FS-Reg.	15,885	24,472	3,258,238	6,132	1.54	205	25	10	21
	F-CCC	4,539	10,729	1,623,899	5,140	2.36	358	45	11	38
	Total	35,975	51,921	7,603,850	20,845	1.44	211	47	8	18

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1939
ST. JOE OPERATION

State	Working	Number of Acres Worked															
		By Forest Service					By Bureau of Entomology and Plant Quarantine					Total					
		Federal					Federal					Federal					
		Forest Service	Public Domain	Total	State	Private	Forest Service	Public Domain	Total	State	Private	Forest Service	Public Domain	Total	State	Private	Total
Idaho	First	6,321	343	6,664	140	1,739		70	70	565	1,667	6,321	413	6,734	705	3,406	10,845
	Second	8,140	510	8,650	360	1,953	3,248	1,690	4,938	2,483	4,975	11,388	2,200	13,588	2,843	6,928	23,359
	Third	678		678		240	190		190	512	151	868		868	512	391	1,771
	Total	15,139	853	15,992	500	3,932	3,438	1,760	5,198	3,560	6,793	18,577	2,613	21,190	4,060	10,725	35,975

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1939
ST. JOE OPERATION

Eradication Type	Average Results for All Areas				Areas With More Than 25 Feet Live Stem Per Acre		
	Acres in Checked Area	Acres Checked	Ribes Per Acre		Acres	Ribes Per Acre	
			Bushes	Live Stem		Bushes	Live Stem
Open Reproduction	21,646	748	10	24	13,953	15	36
Dense Reproduction	1,312	59	2	13			
Open Pole	5,493	243	3	10	341	12	42
Dense Pole	693	17	1	3			
Open Mature	3,214	114	6	15	256	13	72
Burn	106						
All Upland	32,464	1,181	8	20	14,550	15	37
Stream	3,511	381	8	13	154	36	70
All Types	35,975	1,562	8	18	14,704	16	38

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1939
ST. JOE OPERATION

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Open Reproduction	9,056	1,304,517	2,247,349	5,846	132	3,711		3,561,555
	Dense Reproduction	94	4,324	7,232					11,556
	Open Pole	321	30,940	21,501					52,441
	Open Mature	983	96,743	101,978			47,035		245,756
	All Upland	10,454	1,436,524	2,378,060	5,846	132	50,746		3,871,308
	Stream	391	478,437	28,925	61,776	16,910	62		586,110
	All Types	10,845	1,914,961	2,406,985	67,622	17,042	50,808		4,457,418
Second	Open Reproduction	12,439	697,779	942,002	2,514	1,092	481		1,643,868
	Dense Reproduction	1,218	12,730	4,367		98			17,195
	Open Pole	4,892	61,878	96,381	376	4,551			163,186
	Dense Pole	693	6,778	4,957	584				12,319
	Open Mature	2,231	132,794	40,505	12				173,311
	Burn	106	5,306	6,116					11,422
	All Upland	21,579	917,265	1,094,328	3,486	5,741	481		2,021,301
	Stream	1,780	594,066	33,874	63,437	258,588	113	656	950,734
	All Types	23,359	1,511,331	1,128,202	66,923	264,329	594	656	2,972,035
Third	Open Reproduction	151	2,957	8,227					11,184
	Open Pole	280	4,300	5,763					10,063
	All Upland	431	7,257	13,990					21,247
	Stream	1,340	67,355	21	62,362	21,030		2,382	153,150
	All Types	1,771	74,612	14,011	62,362	21,030		2,382	174,397
All Workings	Open Reproduction	21,646	2,005,253	3,197,578	8,360	1,224	4,192		5,216,607
	Dense Reproduction	1,312	17,054	11,599		98			28,751
	Open Pole	5,493	97,118	123,645	376	4,551			225,690
	Dense Pole	693	6,778	4,957	584				12,319
	Open Mature	3,214	229,537	142,483	12		47,035		419,067
	Burn	106	5,306	6,116					11,422
	All Upland	32,464	2,361,046	3,486,378	9,332	5,873	51,227		5,913,856
	Stream	3,511	1,139,858	62,820	187,575	296,528	175	3,038	1,689,994
	All Types	35,975	3,500,904	3,549,198	196,907	302,401	51,402	3,038	7,603,850

SUMMARY OF RIBES ERADICATION, 1929-1939
ST. JOE OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray
Open Reproduction	166,969	38,457	414	205,840	262,061	82,593,452	
Dense Reproduction	42,990	3,049		46,039	12,431	1,888,324	
Open Pole	62,879	10,037	280	73,196	33,137	7,256,479	
Dense Pole	22,660	1,515		24,175	5,254	972,548	
Open Mature	182,082	6,976		189,058	80,171	21,976,346	
Dense Mature	9,745	274		10,019	1,614	267,557	
Cutover	1,009	134		1,143	657	100,382	
Brush	2,452	332		2,784	1,888	677,365	
Burn	2,224	106		2,330	1,164	806,886	
Subalpine	200			200	416	90,809	
All Upland	493,210	60,880	694	554,784	398,793	116,630,148	
Stream (Hand)	34,544	11,590	5,424	51,558	91,467	26,764,536	
Stream (Chemical)	7,384	2,914	447	10,745	26,273	2,350,245	783,415
Stream (Slash)	791	27		818	10,420	409,100	
All Stream	35,335	11,617	5,424	52,376	128,160	29,523,881	
All Types	528,545	72,497	6,118	607,160	526,953	146,154,029	

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis		
					Man Days	Ribes	Gallons Spray
Open Reproduction	166,969	219,733	76,501,334		1.32	458	
Dense Reproduction	42,990	11,063	1,744,524		.26	41	
Open Pole	62,879	28,152	6,811,463		.45	108	
Dense Pole	22,660	4,575	915,455		.20	40	
Open Mature	182,082	76,381	21,314,030		.42	117	
Dense Mature	9,745	1,559	255,434		.16	26	
Cutover	1,009	654	100,332		.65	99	
Brush	2,452	1,881	676,620		.77	276	
Burn	2,224	1,061	795,464		.48	358	
Subalpine	200	416	90,809		2.08	454	
All Upland	493,210	345,475	109,205,465		.70	221	
Stream (Hand)	34,544	63,787	20,784,981		1.85	602	
Stream (Chemical)	7,384	21,605	2,007,093	669,031	2.93	272	91
Stream (Slash)	791	10,101	395,600		12.77	500	
All Stream	35,335	95,493	23,187,674		2.70	656	
All Types	528,545	440,968	132,393,139		.83	250	

TABLE NO. 8B - SECOND WORKING

Open Reproduction	38,457	41,935	6,073,115		1.09	158	
Dense Reproduction	3,049	1,368	143,800		.45	47	
Open Pole	10,037	4,799	434,953		.48	43	
Dense Pole	1,515	679	57,093		.45	38	
Open Mature	6,976	3,790	662,316		.54	95	
Dense Mature	274	55	12,123		.20	44	
Cutover	134	3	50		.02	1	
Brush	332	7	745		.02	2	
Burn	106	103	11,422		.97	108	
All Upland	60,880	52,739	7,395,617		.87	121	
Stream (Hand)	11,590	19,839	4,553,657		1.71	393	
Stream (Chemical)	2,914	4,315	312,009	104,003	1.48	107	36
Stream (Slash)	27	319	13,500		11.81	500	
All Stream	11,617	24,473	4,879,166		2.11	420	
All Types	72,497	77,212	12,274,783		1.07	169	

TABLE NO. 8C - THIRD WORKING

Open Reproduction	414	393	19,003		.95	46	
Open Pole	280	186	10,063		.66	36	
All Upland	694	579	29,066		.83	42	
Stream (Hand)	5,424	7,841	1,425,898		1.45	263	
Stream (Chemical)	447	353	31,143	10,381	.79	70	23
All Stream	5,424	8,194	1,457,041		1.51	269	
All Types	6,118	8,773	1,486,107		1.43	243	

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1939
ST. JOE OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis		
						Man Days	Ribes	Gallons Per Sprayed Area
First	FS-Reg.	80,600	80,545	24,019,607	262,145	1.00	298	95
	EQ-NIRA	42,366	25,571	7,734,978	10,839	.60	183	68
	FS-NIRA	70,714	44,246	14,845,626	101,476	.63	210	129
	EQ-ERA	146,491	92,122	29,321,433	52,667	.63	200	113
	FS-ERA	267	892	487,480		3.34	1,826	
	Cooperative	17,073	13,484	3,864,001	56,611	.79	226	41
	F-CCC	102,679	133,671	40,293,631	162,703	1.30	392	117
	S&P-CCC	68,355	50,437	11,826,383	22,590	.74	173	53
	Total	528,545	440,968	132,393,139	669,031	.83	250	91
Second	FS-Reg.	25,902	28,540	4,173,167	33,431	1.10	161	26
	EQ-NIRA	1,742	1,228	291,131		.70	167	
	EQ-ERA	31,529	26,180	4,628,582	9,657	.83	147	33
	Cooperative	489	291	48,475	2,674	.60	99	11
	F-CCC	10,587	16,616	2,677,829	29,289	1.57	253	55
	S&P-CCC	2,248	4,357	455,599	28,952	1.94	203	54
	Total	72,497	77,212	12,274,783	104,003	1.07	169	36
Third	FS-Reg.	2,295	3,049	520,222	2,859	1.33	227	27
	EQ-ERA	1,834	2,179	419,549	3,025	1.19	229	12
	F-CCC	1,920	3,483	543,478	4,497	1.81	283	46
	S&P-CCC	69	62	2,858		.90	41	
	Total	6,118	8,773	1,486,107	10,381	1.43	243	23
All Workings	FS-Reg.	108,797	112,134	28,712,996	298,435	1.03	264	71
	EQ-NIRA	44,108	26,799	8,026,109	10,839	.61	182	68
	FS-NIRA	70,714	44,246	14,845,626	101,476	.63	210	129
	EQ-ERA	179,854	120,481	34,369,564	65,349	.67	191	65
	FS-ERA	267	892	487,480		3.34	1,826	
	Cooperative	17,562	13,775	3,912,476	59,285	.78	223	36
	F-CCC	115,186	153,770	43,514,938	196,489	1.33	378	98
	S&P-CCC	70,672	54,856	12,284,840	51,542	.78	174	53
	Total	607,160	526,953	146,154,029	783,415	.87	241	73

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1939
ST. JOE OPERATION

Working	Number of Acres Worked by Ownership Classes					
	Federal			State-Idaho	Private	Total
	Forest Service	Public Domain	Total			
First	210,403	12,498	222,901	66,730	238,914	528,545
Second	38,527	3,881	42,408	7,564	22,525	72,497
Third	3,127	84	3,211	724	2,183	6,118
All Workings	252,057	16,463	268,520	75,018	263,622	607,160

TABLE NO. 11

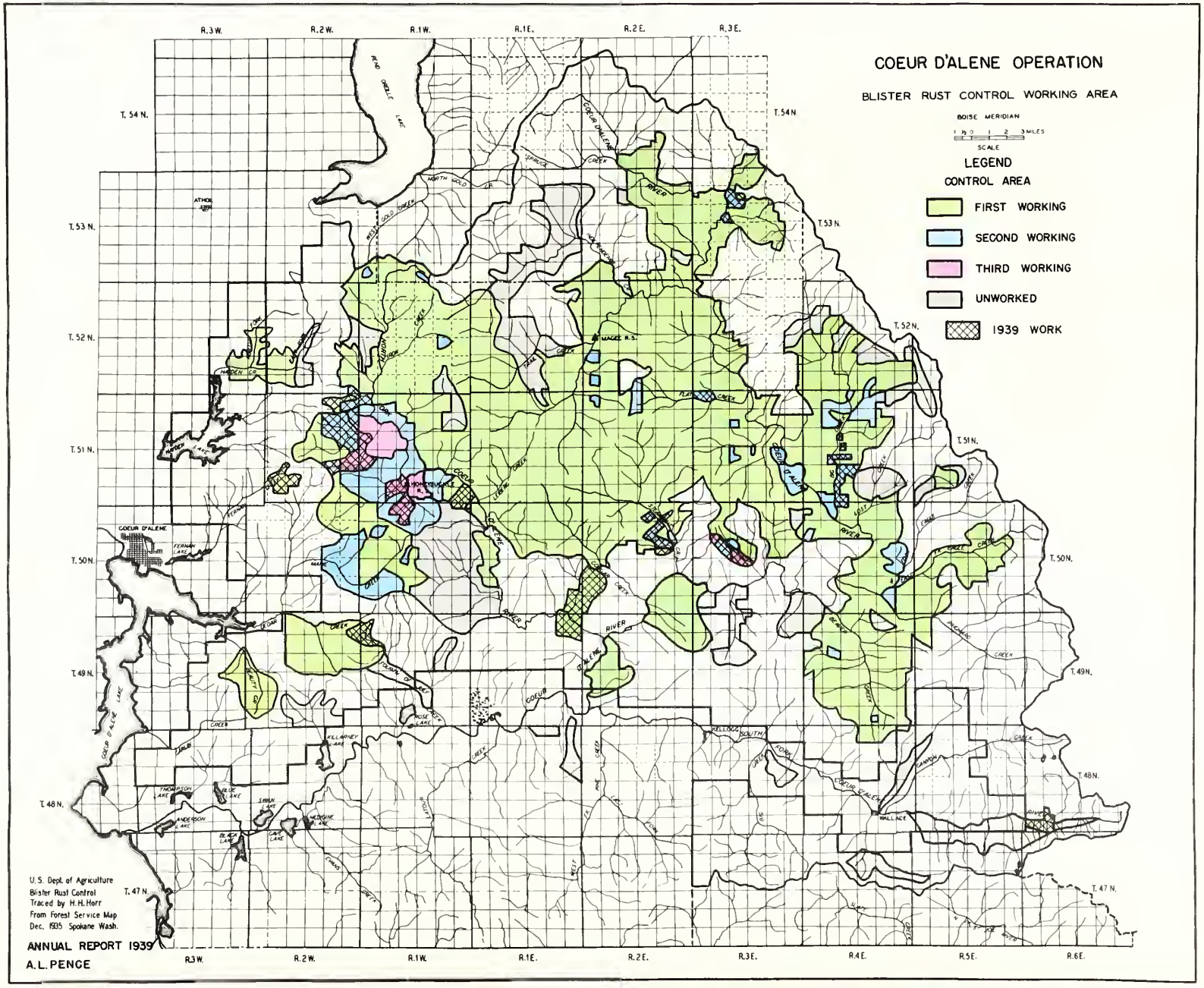
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1939
ST. JOE OPERATION

Ownership Class	Number of Acres		
	Worked	Unworked	Total
Forest Service	210,403	101,677	312,080
Public Domain	12,498	11,967	24,465
Sub-total Federal	222,901	113,644	336,545
State	66,730	48,205	114,935
Private	238,914	194,531	433,445
Total	528,545	356,380	884,925

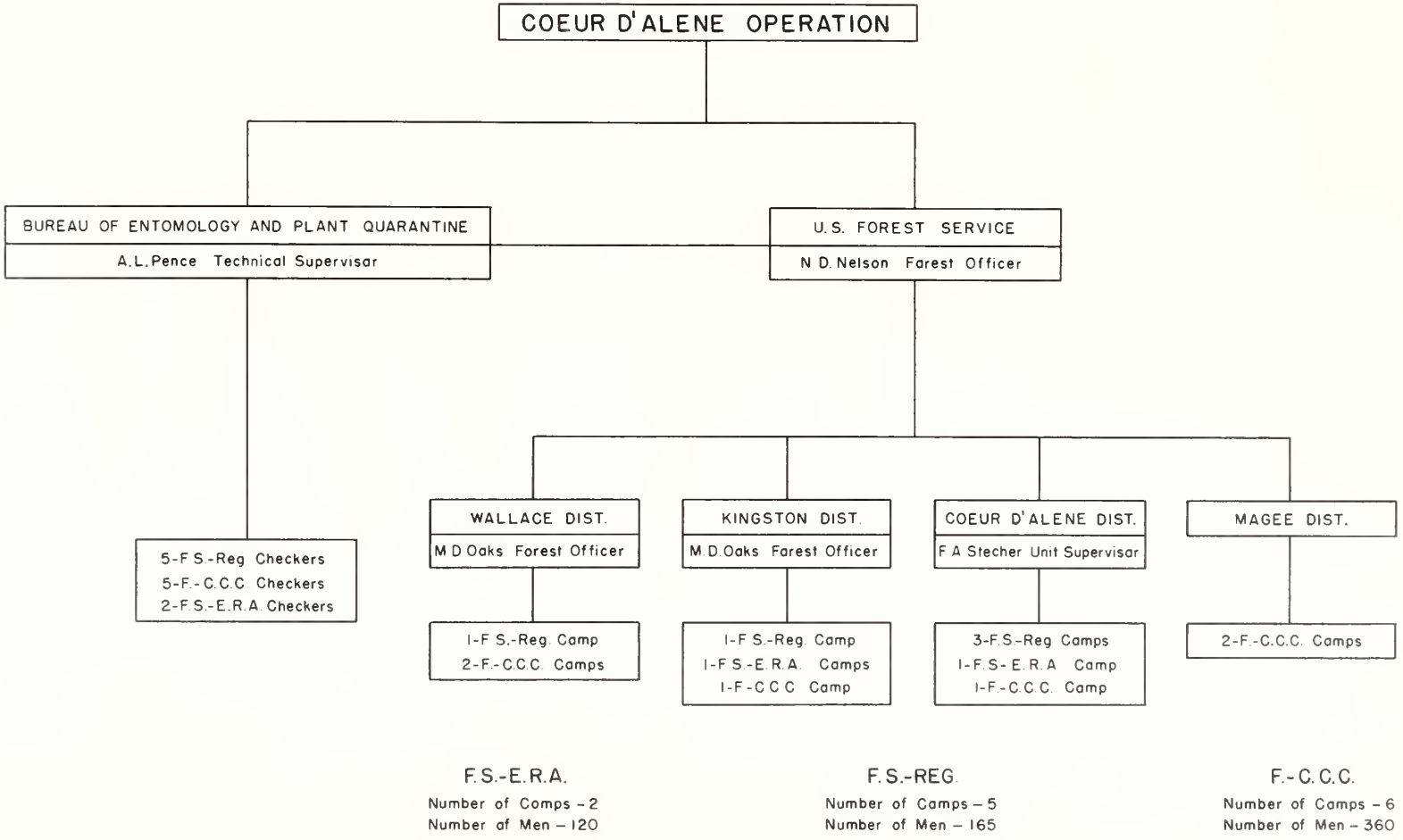
TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1929-1939
ST. JOE OPERATION

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Open Reproduction	166,969	13,899,201	62,059,141	100,145	304,587	138,260		76,501,334
	Dense Reproduction	42,990	809,862	878,462	13,310	27,287	15,603		1,744,524
	Open Pole	62,879	2,755,060	3,898,280	19,835	61,506	76,782		6,811,463
	Dense Pole	22,660	454,627	457,299	1,335	1,993	201		915,455
	Open Mature	182,082	10,717,048	10,303,525	27,828	42,519	223,110		21,314,030
	Dense Mature	9,745	160,499	94,546	389				255,434
	Cutover	1,009	64,897	30,125	5,269	41			100,332
	Brush	2,452	93,470	579,731	1,987	1,432			676,620
	Burn	2,224	133,557	652,633	8,327	947			795,464
	Subalpine	200	54,975	35,834					90,809
	All Upland	493,210	29,143,196	78,989,576	178,425	440,312	453,956		109,205,465
	Stream	35,335	16,224,375	878,202	3,329,801	2,738,469	16,695	132	23,187,674
	All Types	528,545	45,367,571	79,867,778	3,508,226	3,178,781	470,651	132	132,393,139
Second	Open Reproduction	38,457	2,543,059	3,487,523	28,915	8,994	4,624		6,073,115
	Dense Reproduction	3,049	68,720	74,982		98			143,800
	Open Pole	10,037	227,674	202,334	388	4,557			434,953
	Dense Pole	1,515	29,111	27,398	584				57,093
	Open Mature	6,976	298,232	358,587	43	19	5,435		662,316
	Dense Mature	274	4,629	7,494					12,123
	Cutover	134	30			20			50
	Brush	332		745					745
	Burn	106	5,306	6,116					11,422
	All Upland	60,880	3,176,761	4,165,179	29,930	13,688	10,059		7,395,617
	Stream	11,617	2,804,869	142,751	1,049,047	734,955	6,073	141,471	4,879,166
	All Types	72,497	5,981,630	4,307,930	1,078,977	748,643	16,132	141,471	12,274,783
Third	Open Reproduction	414	4,809	14,194					19,003
	Open Pole	280	4,300	5,763					10,063
	All Upland	694	9,109	19,957					29,066
	Stream	5,424	633,208	21,536	442,553	357,362		2,382	1,457,041
	All Types	6,118	642,317	41,493	442,553	357,362		2,382	1,486,107
All Workings	Open Reproduction	205,840	16,447,069	65,560,858	129,060	313,581	142,884		82,593,452
	Dense Reproduction	46,039	878,582	953,444	13,310	27,385	15,603		1,888,324
	Open Pole	73,196	2,987,034	4,106,377	20,223	66,063	76,782		7,256,479
	Dense Pole	24,175	483,738	484,697	1,919	1,993	201		972,548
	Open Mature	189,058	11,015,280	10,662,112	27,871	42,538	228,545		21,976,346
	Dense Mature	10,019	165,128	102,040	389				267,557
	Cutover	1,143	64,927	30,125	5,269	61			100,382
	Brush	2,784	93,470	580,476	1,987	1,432			677,365
	Burn	2,330	138,863	658,749	8,327	947			806,886
	Subalpine	200	54,975	35,834					90,809
	All Upland	554,784	32,329,066	83,174,712	208,355	454,000	464,015		116,630,148
	Stream	52,376	19,662,452	1,042,489	4,821,401	3,830,786	22,768	143,985	29,523,881
	All Types	607,160	51,991,518	84,217,201	5,029,756	4,284,786	486,783	143,985	146,154,029


COEUR D'ALENE OPERATION
BLISTER RUST CONTROL WORKING AREA
BOISE MERIDIAN
SCALE
LEGEND
CONTROL AREA
FIRST WORKING
SECOND WORKING
THIRD WORKING
UNWORKED
1939 WORK
R.3W.
R.2W.
R.1W.
R.1E.
R.2E.
R.3E.
R.4E.
R.5E.
R.6E.
T. 54 N.
T. 53 N.
T. 52 N.
T. 51 N.
T. 50 N.
T. 49 N.
T. 48 N.
T. 47 N.
COEUR D'ALENE
HAYDEN LAKE
HAYDEN LK.
FERNAN LAKE
THOMPSON LAKE
BLUE LAKE
SWAN LAKE
ANDERSON LAKE
BLACK LAKE
CAVE LAKE
KILLARNEY LAKE
ROSE LAKE
MEDIMONT L. LAKE
ROCKY LAKE
MAGEE R.S.
HONEYSUCKLE R.S.
ATHOL R.S.
KELLOGG SOUTH
WALLACE
COEUR D'ALENE LAKE
COEUR D'ALENE RIVER
ST. JOE RIVER
U.S. Dept. of Agriculture
Blister Rust Control
Traced by H.H. Horr
From Forest Service Map
Dec. 1935 Spokane Wash.
ANNUAL REPORT 1939
A.L. PENCE

ORGANIZATION CHART



F.S.-E.R.A.
Number of Comps – 2
Number af Men – 120

F.S.-REG.
Number of Camps – 5
Number of Men – 165

F.-C.C.C.
Number of Camps – 6
Number of Men – 360

Total Number of Men on Blister Rust Work-645

SUMMARY OF RIBES ERADICATION, 1939
COEUR D'ALENE OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Ribes Remaining Per Acre	
							Bushes	Live Stem
Open Reproduction	977	2,170	463	3,610	6,193	633,386	6.6	18.4
Dense Reproduction	26	197		223	439	22,300	2.7	6.8
Open Pole	3,310	281		3,591	2,945	208,102	2.4	7.9
Dense Pole	37			37	52	3,854	1.0	23.0
Open Mature	350	1,256		1,606	2,389	205,634	3.3	10.1
Cutover	691	1,786	2,356	4,833	6,891	1,175,684	7.2	12.1
All Upland	5,391	5,690	2,819	13,900	18,909	2,248,960	5.3	12.3
Stream (Hand)	245	362	192	799	1,981	284,676	7.0	11.3
Stream (Zone)		17		17	40	4,432	1.6	1.6
All Stream	245	379	192	816	2,021	289,108	7.0	11.2
All Types	5,636	6,069	3,011	14,716	20,930	2,538,068	5.5	12.2

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man Days	Ribes	Bushes	Live Stem
Open Reproduction	977	1,750	327,099	1.79	335	4.4	9.7
Dense Reproduction	26	81	6,366	3.12	245	4.0	18.0
Open Pole	3,310	2,832	204,922	.86	62	2.1	7.8
Dense Pole	37	52	3,854	1.41	104	1.0	23.0
Open Mature	350	871	105,086	2.49	300	5.1	17.4
Cutover	691	1,385	277,918	2.00	402	8.3	18.6
All Upland	5,391	6,971	925,245	1.29	172	3.6	10.3
Stream (Hand)	245	1,040	200,545	4.24	819	3.7	9.9
All Types	5,636	8,011	1,125,790	1.42	200	3.6	10.3

TABLE NO. 3B - SECOND WORKING

Open Reproduction	2,170	3,241	229,712	1.49	106	6.2	17.1
Dense Reproduction	197	358	15,934	1.82	81	2.6	5.5
Open Pole	281	113	3,180	.40	11	4.8	9.1
Open Mature	1,256	1,518	100,548	1.21	80	2.8	8.1
Cutover	1,786	2,221	531,764	1.24	298	8.2	10.2
All Upland	5,690	7,451	881,138	1.31	155	5.9	12.1
Stream (Hand)	362	595	61,729	1.64	171	8.5	13.9
Stream (Zone)	17	40	4,432	2.35	261	1.6	1.6
All Stream	379	635	66,161	1.68	175	8.4	13.6
All Types	6,069	8,086	947,299	1.33	156	6.1	12.2

TABLE NO. 3C - THIRD WORKING

Open Reproduction	463	1,202	76,575	2.60	165	13.8	45.3
Cutover	2,356	3,285	366,002	1.39	155	6.0	11.4
All Upland	2,819	4,487	442,577	1.59	157	7.1	16.5
Stream (Hand)	192	346	22,402	1.80	117	10.9	10.2
All Types	3,011	4,833	464,979	1.61	154	7.7	15.5

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1939
COEUR D'ALENE OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
					Man Days	Ribes	Bushes	Live Stem
First	FS-ERA	3,460	4,054	527,124	1.17	152	3.1	9.9
	FS-Reg.	1,457	2,204	340,641	1.51	234	3.9	12.1
	F-CCC	719	1,753	258,025	2.44	359	6.0	9.2
	Total	5,636	8,011	1,125,790	1.42	200	3.6	10.3
Second	FS-Reg.	3,169	3,461	681,102	1.09	215	7.9	15.6
	F-CCC	2,900	4,625	266,197	1.59	92	4.5	9.0
	Total	6,069	8,086	947,299	1.33	156	6.1	12.2
Third	FS-Reg.	1,598	2,307	315,513	1.44	197	8.5	18.1
	F-CCC	1,413	2,526	149,466	1.79	106	6.9	13.1
	Total	3,011	4,833	464,979	1.61	154	7.7	15.6
All Workings	FS-ERA	3,460	4,054	527,124	1.17	152	3.1	9.9
	FS-Reg.	6,224	7,972	1,337,256	1.28	215	7.2	15.6
	F-CCC	5,032	8,904	673,688	1.77	134	5.4	10.3
	Total	14,716	20,930	2,538,068	1.42	172	5.5	12.2

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1939
COEUR D'ALENE OPERATION

State	Working	Number of Acres Worked By Forest Service			Total
		Forest Service	State	Private	
Idaho	First	4,054	432	1,150	5,636
	Second	5,981	68	20	6,069
	Third	3,011			3,011
	Total	13,046	500	1,170	14,716

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1939
COEUR D'ALENE OPERATION

Eradication Type	Average Results for All Areas				Areas With More Than 25 Feet Live Stem Per Acre		
	Acres in Checked Area	Acres Checked	Ribes per Acre		Acres	Ribes per Acre	
			Bushes	Live Stem		Bushes	Live Stem
Open Reproduction	3,610	141	6.6	18.4	860	16.0	49.9
Dense Reproduction	223	10	2.7	6.8			
Open Pole	3,591	141	2.4	7.9	285	13.2	37.2
Dense Pole	37	1	1.0	23.0			
Open Mature	1,606	60	3.3	10.1			
Cutover	4,833	191	7.2	12.1	451	26.5	57.4
All Upland	13,900	544	5.3	12.3	1,596	18.0	49.4
Stream (Hand)	799	76	7.0	11.3	60	68.6	44.2
Stream (Zone)	17	1	1.6	1.6			
All Stream	816	77	7.0	11.2	60	68.6	44.2
All Types	14,716	621	5.5	12.2	1,656	21.7	49.0

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1939
COEUR D'ALENE OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	
First	Open Reproduction	977	243,566	80,179	2,227	1,079	48	327,099
	Dense Reproduction	26	6,355	11				6,366
	Open Pole	3,310	89,537	113,081	590	1,714		204,922
	Dense Pole	37	475	3,379				3,854
	Open Mature	350	51,688	53,391		7		105,086
	Cutover	691	109,874	168,031			13	277,918
	All Upland	5,391	501,495	418,072	2,817	2,800	61	925,245
	Stream	245	104,785	1,757	30,631	63,372		200,545
	All Types	5,636	606,280	419,829	33,448	66,172	61	1,125,790
Second	Open Reproduction	2,170	161,148	65,725		834	2,005	229,712
	Dense Reproduction	197	14,854	997			83	15,934
	Open Pole	281	1,664	1,516				3,180
	Open Mature	1,256	81,420	18,545		18	565	100,548
	Cutover	1,786	419,120	112,644				531,764
	All Upland	5,690	678,206	199,427		852	2,653	881,138
	Stream	379	59,020	286		6,855		66,161
	All Types	6,069	737,226	199,713		7,707	2,653	947,299
Third	Open Reproduction	463	22,668	53,907				76,575
	Cutover	2,356	333,932	32,070				366,002
	All Upland	2,819	356,600	85,977				442,577
	Stream	192	20,510			1,892		22,402
	All Types	3,011	377,110	85,977		1,892		464,979
All Workings	Open Reproduction	3,610	427,382	199,811	2,227	1,913	2,053	633,386
	Dense Reproduction	223	21,209	1,008			83	22,300
	Open Pole	3,591	91,201	114,597	590	1,714		208,102
	Dense Pole	37	475	3,379				3,854
	Open Mature	1,606	133,108	71,936		25	565	205,634
	Cutover	4,833	862,926	312,745			13	1,175,684
	All Upland	13,900	1,536,301	703,476	2,817	3,652	2,714	2,248,960
	Stream	816	184,315	2,043	30,631	72,119		289,108
	All Types	14,716	1,720,616	705,519	33,448	75,771	2,714	2,538,068

SUMMARY OF RIBES ERADICATION, 1927-1939
COEUR D'ALENE OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes
Open Reproduction	67,224	5,966	942	74,132	130,013	18,542,081
Dense Reproduction	11,832	849		12,681	11,568	1,169,844
Open Pole	48,115	4,152	577	52,844	29,339	4,359,244
Dense Pole	16,167	228	92	16,487	4,313	602,520
Open Mature	128,631	9,752	1,445	139,828	94,960	15,137,680
Dense Mature	13,023	651		13,674	2,100	261,153
Cutover	11,185	5,652	2,622	19,459	27,646	5,884,732
Brush	10,419	507		10,926	15,233	2,264,565
Burn	5,619			5,619	3,509	753,959
Subalpine	485			485	283	76,762
Meadow-Field	157			157		
All Upland	312,857	27,757	5,678	346,292	318,964	49,052,540
Stream (Hand)	13,046	3,401	494	16,941	56,397	11,928,108
Stream (Slash)	78	13		91	1,792	68,731
Stream (Machine)	1,045	87		1,132	5,038	566,000
Stream (Zone)	118	2,274		2,392	1,837	150,192
All Stream	14,287	5,775	494	20,556	65,064	12,713,031
All Types	327,144	33,532	6,172	366,848	384,028	61,765,571

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Ribes
Open Reproduction	67,224	115,438	17,318,661	1.72	258
Dense Reproduction	11,832	10,586	1,075,972	.89	91
Open Pole	48,115	25,971	3,778,957	.54	79
Dense Pole	16,167	4,156	590,472	.26	37
Open Mature	128,631	86,408	13,980,234	.67	109
Dense Mature	13,023	1,761	222,188	.14	17
Cutover	11,185	15,078	4,124,646	1.35	369
Brush	10,419	14,499	2,166,698	1.39	208
Burn	5,619	3,509	753,959	.62	134
Subalpine	485	283	76,762	.58	158
Meadow-Field	157				
All Upland	312,857	277,689	44,088,549	.89	141
Stream (Hand)	13,046	48,361	10,880,994	3.71	834
Stream (Slash)	78	1,340	64,934	17.18	832
Stream (Machine)	1,045	4,616	522,500	4.42	500
Stream (Zone)	118	147	15,402	1.25	131
All Stream	14,287	54,464	11,483,830	3.81	804
All Types	327,144	332,153	55,572,379	1.02	170

TABLE NO. 8B - SECOND WORKING

Open Reproduction	5,966	12,655	1,095,543	2.12	184
Dense Reproduction	849	982	93,872	1.16	111
Open Pole	4,152	2,768	477,719	.67	115
Dense Pole	228	86	6,973	.38	31
Open Mature	9,752	7,868	1,056,619	.81	108
Dense Mature	651	339	38,965	.52	60
Cutover	5,652	8,331	1,280,519	1.47	227
Brush	507	734	97,867	1.45	193
All Upland	27,757	33,763	4,148,077	1.22	149
Stream (Hand)	3,401	7,414	1,007,146	2.18	296
Stream (Slash)	13	452	3,794	34.77	292
Stream (Machine)	87	422	43,500	4.85	500
Stream (Zone)	2,274	1,690	134,790	.74	59
All Stream	5,775	9,978	1,189,230	1.73	206
All Types	33,532	43,741	5,337,307	1.30	159

TABLE NO. 8C - THIRD WORKING

Open Reproduction	942	1,920	127,877	2.04	136
Open Pole	577	600	102,568	1.04	178
Dense Pole	92	71	5,075	.77	55
Open Mature	1,445	684	100,827	.47	70
Cutover	2,622	4,237	479,567	1.62	183
All Upland	5,678	7,512	815,914	1.32	144
Stream (Hand)	494	622	39,971	1.26	81
All Types	6,172	8,134	855,885	1.32	139

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1927-1939
COEUR D'ALENE OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis	
					Man Days	Ribes
First	EQ-Reg.	25,776	8,351	2,846,383	.33	110
	FS-Reg.	34,447	33,712	6,671,353	.98	194
	FS-NIRA	86,083	59,504	13,399,102	.69	156
	EQ-ERA	40,997	35,497	6,584,066	.87	161
	FS-ERA	14,315	17,784	2,839,910	1.24	198
	F-CCC	125,526	177,305	23,231,665	1.41	185
	Total	327,144	332,153	55,572,379	1.02	170
Second	FS-Reg.	11,743	10,421	2,214,417	.89	189
	FS-NIRA	5,300	2,869	498,629	.54	94
	EQ-ERA	42	44	5,151	1.05	123
	FS-ERA	1,103	1,986	359,864	1.71	326
	F-CCC	15,344	28,521	2,259,246	1.86	147
	Total	33,532	43,741	5,337,307	1.30	159
Third	FS-Reg.	3,721	3,716	546,271	1.00	147
	F-CCC	2,451	4,418	309,614	1.80	126
	Total	6,172	8,134	855,885	1.32	139
All Workings	EQ-Reg.	25,776	8,351	2,846,383	.33	110
	FS-Reg.	49,911	47,849	9,432,041	.96	189
	FS-NIRA	91,383	62,373	13,997,731	.68	152
	EQ-ERA	41,039	35,541	6,589,217	.87	161
	FS-ERA	15,418	19,670	3,199,674	1.28	208
	F-CCC	143,321	210,244	25,800,525	1.47	180
	Total	366,848	384,028	61,765,571	1.05	168

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1927-1939
COEUR D'ALENE OPERATION

Working	Number of Acres Worked by Ownership Classes			Total
	Forest Service	State - Idaho	Private	
First	308,658	5,646	12,840	327,144
Second	29,962	248	3,322	33,532
Third	5,732		440	6,172
All Workings	344,352	5,894	16,602	366,848

TABLE NO. 11

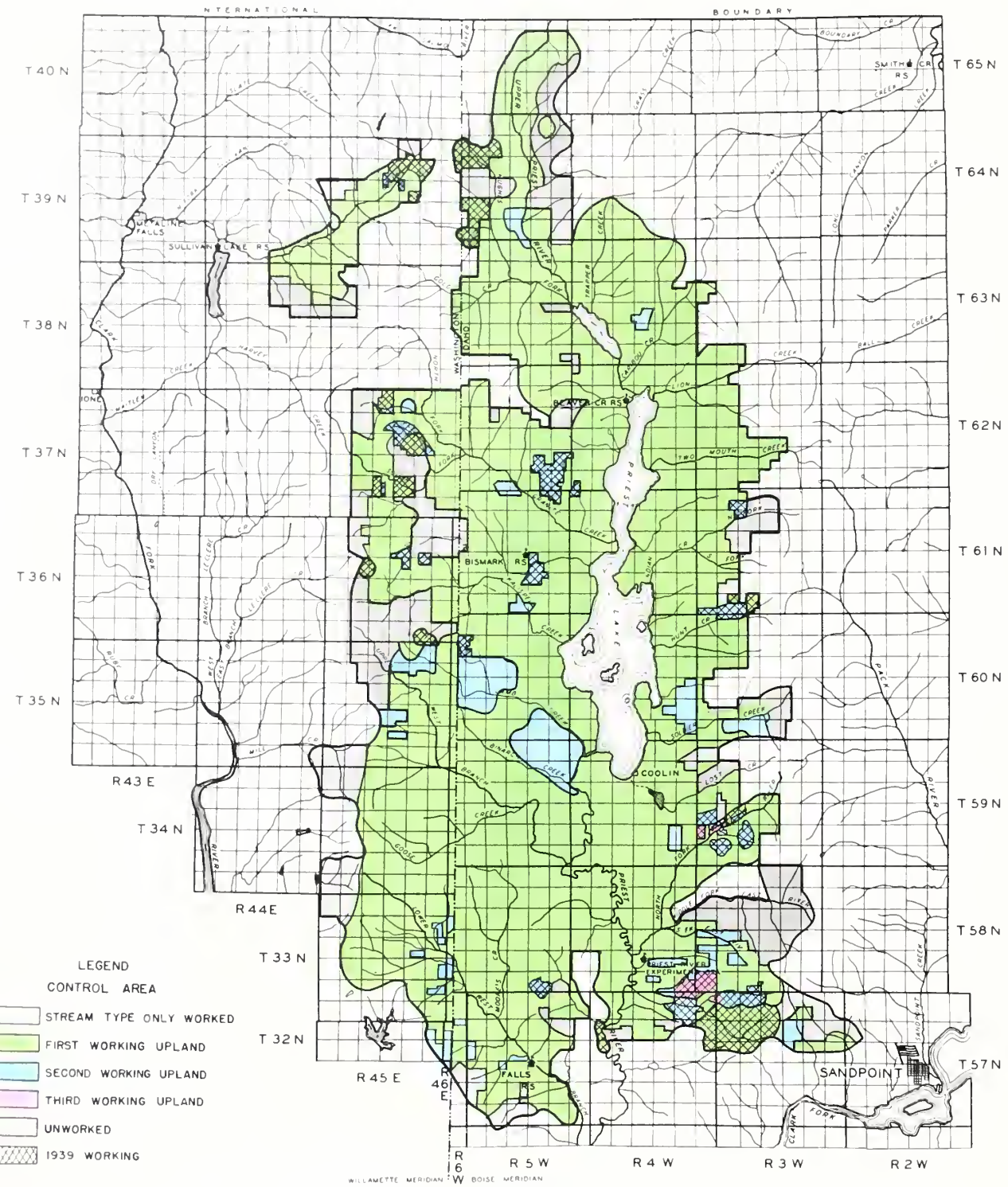
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1927-1939
COEUR D'ALENE OPERATION

Ownership Class	Number of Acres		
	Worked	Unworked	Total
Forest Service	308,658	51,492	360,150
Public Domain		2,110	2,110
Sub-total Federal	308,658	53,602	362,260
State - Idaho	5,646	1,109	6,755
Private	12,840	13,740	26,580
Total	327,144	68,451	395,595

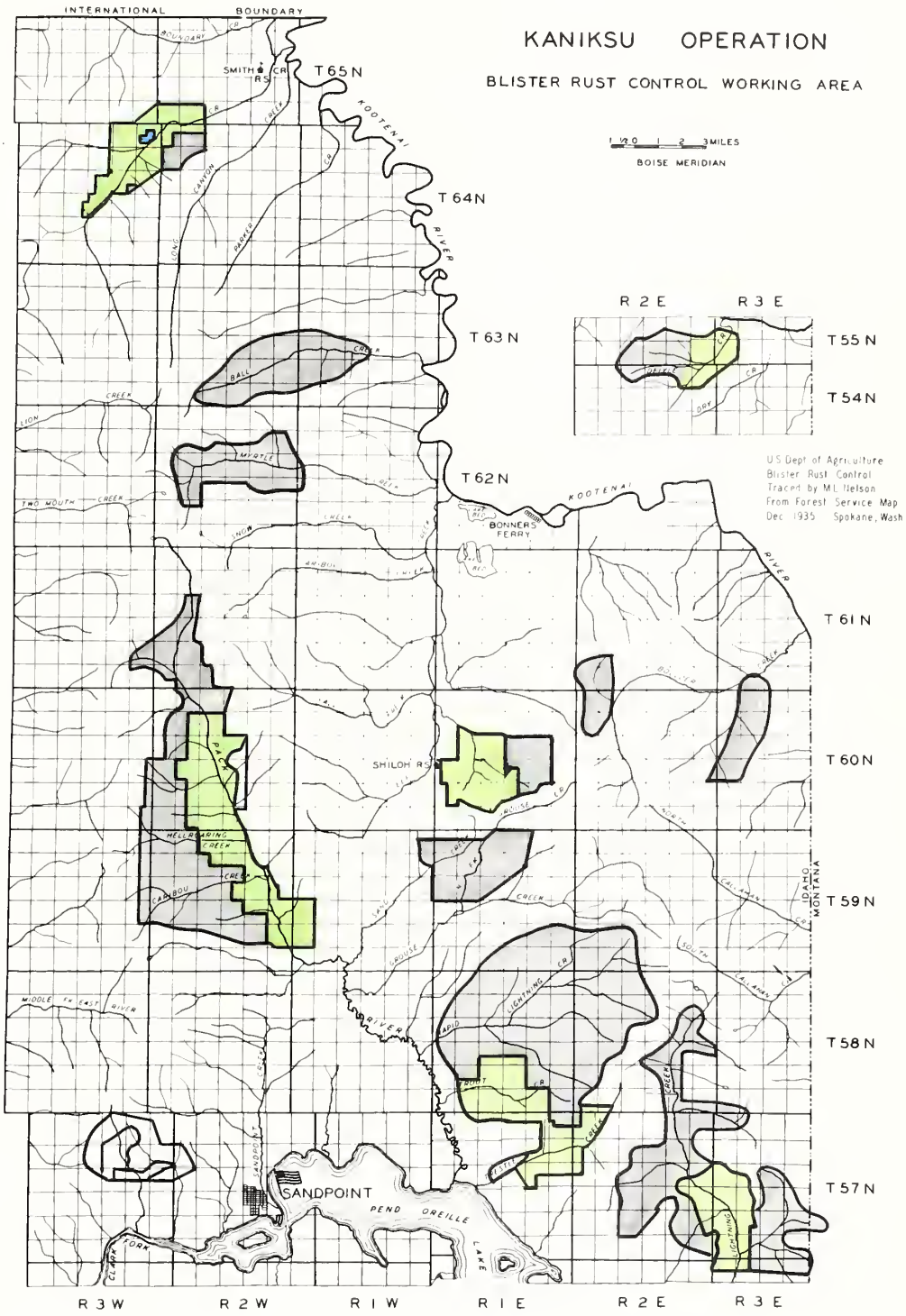
TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1927-1939
COEUR D'ALENE OPERATION

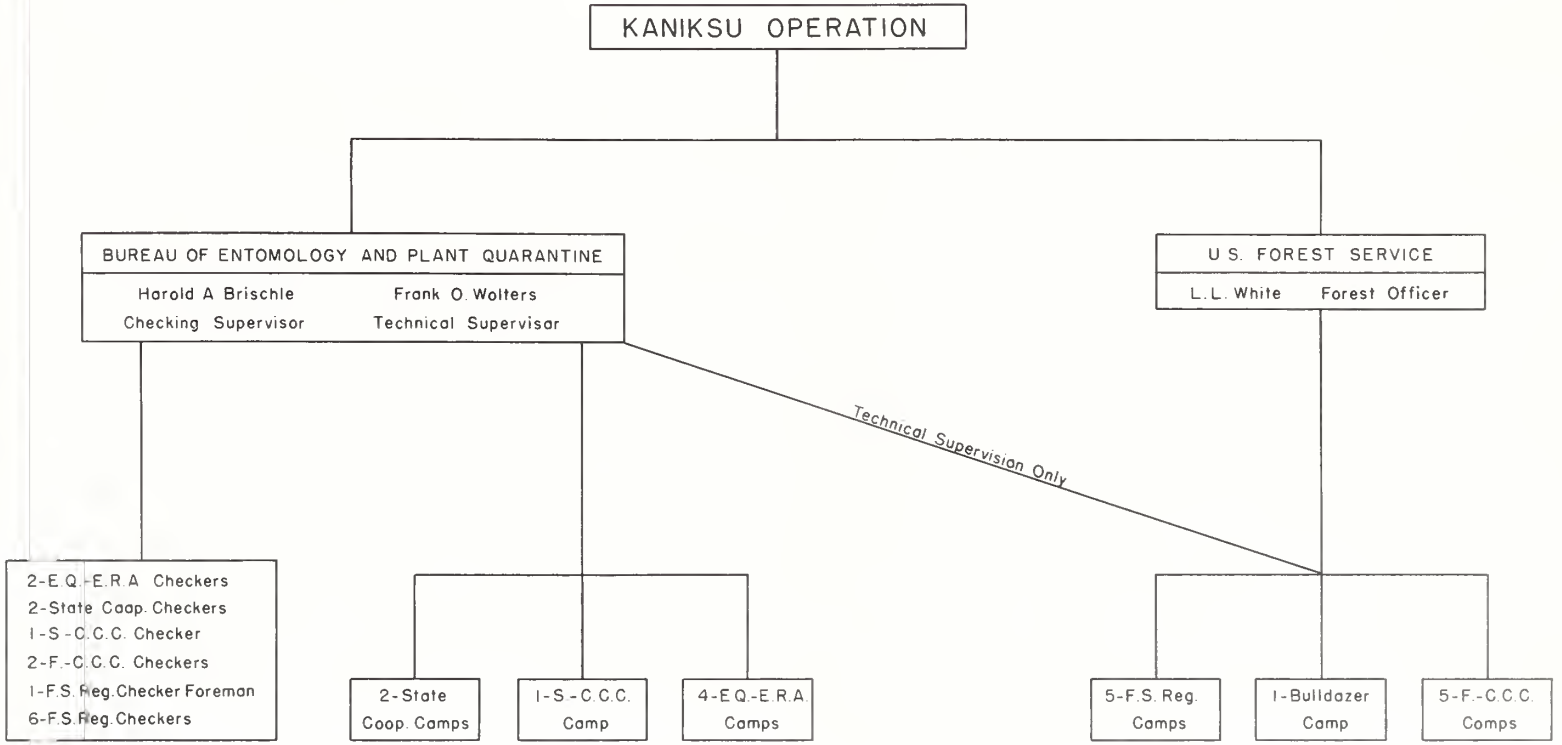
Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	
First	Open Reproduction	67,224	10,115,458	6,603,250	2,227	498,923	98,803	17,318,661
	Dense Reproduction	11,832	665,227	402,844		5,323	2,578	1,075,972
	Open Pole	48,115	2,132,138	1,583,439	12,246	9,082	42,052	3,778,957
	Dense Pole	16,167	436,946	148,497		3,741	1,288	590,472
	Open Mature	128,631	10,855,122	2,895,824	1	79,624	149,663	13,980,234
	Dense Mature	13,023	193,735	17,816		9,778	859	222,188
	Cutover	11,185	2,751,653	1,327,871	1	17,536	27,585	4,124,646
	Brush	10,419	769,734	1,365,959		25,748	5,257	2,166,698
	Burn	5,619	344,681	390,324		13,530	5,424	753,959
	Subalpine	485	55,561	21,201				76,762
	Meadow-Field	157						
	All Upland	312,857	28,320,255	14,757,025	14,475	663,285	333,509	44,088,549
	Stream	14,287	7,009,437	177,659	31,474	4,196,873	68,387	11,483,830
	All Types	327,144	35,329,692	14,934,684	45,949	4,860,158	401,896	55,572,379
Second	Open Reproduction	5,966	498,579	580,706		12,194	4,064	1,095,543
	Dense Reproduction	849	87,139	6,639		11	83	93,872
	Open Pole	4,152	383,009	85,527	4,736	3,882	565	477,719
	Dense Pole	228	6,484	489				6,973
	Open Mature	9,752	752,841	288,577		11,089	4,112	1,056,619
	Dense Mature	651	37,723	1,017			225	38,965
	Cutover	5,652	1,017,661	246,348		13,430	3,080	1,280,519
	Brush	507	11,517	86,350				97,867
	All Upland	27,757	2,794,953	1,295,653	4,736	40,606	12,129	4,148,077
	Stream	5,775	809,914	41,480		331,835	6,001	1,189,230
	All Types	33,532	3,604,867	1,337,133	4,736	372,441	18,130	5,337,307
Third	Open Reproduction	942	70,734	57,143				127,877
	Open Pole	577	91,845	10,723				102,568
	Dense Pole	92	5,075					5,075
	Open Mature	1,445	86,783	14,044				100,827
	Cutover	2,622	414,315	65,252				479,567
	All Upland	5,678	668,752	147,162				815,914
	Stream	494	38,038	41		1,892		39,971
	All Types	6,172	706,790	147,203		1,892		855,885
All Workings	Open Reproduction	74,132	10,684,771	7,241,099	2,227	511,117	102,867	18,542,081
	Dense Reproduction	12,681	752,366	409,483		5,334	2,661	1,169,844
	Open Pole	52,844	2,606,992	1,679,689	16,982	12,964	42,617	4,359,244
	Dense Pole	16,487	448,505	148,986		3,741	1,288	602,520
	Open Mature	139,828	11,694,746	3,198,445	1	90,713	153,775	15,137,680
	Dense Mature	13,674	231,458	18,833		9,778	1,084	261,153
	Cutover	19,459	4,183,629	1,639,471	1	30,966	30,665	5,884,732
	Brush	10,926	781,251	1,452,309		25,748	5,257	2,264,565
	Burn	5,619	344,681	390,324		13,530	5,424	753,959
	Subalpine	485	55,561	21,201				76,762
	Meadow-Field	157						
	All Upland	346,292	31,783,960	16,199,840	19,211	703,891	345,638	49,052,540
	Stream	20,556	7,857,389	219,180	31,474	4,530,600	74,388	12,713,031
	All Types	366,848	39,641,349	16,419,020	50,685	5,234,491	420,026	61,765,571



UAL REPORT 1939
WALTERS


KANIKSU OPERATION
BLISTER RUST CONTROL WORKING AREA
1 0 1 2 3 MILES
BOISE MERIDIAN
INTERNATIONAL BOUNDARY
T65N
T64N
T63N
T62N
T61N
T60N
T59N
T58N
T57N
R3W
R2W
R1W
R1E
R2E
R3E
SMITH CR RS
KOOTENAI RIVER
BALL CR
MYOTE
TWO MOUTH CREEK
BONNERS FERRY
SHILOH RS
HELLROARING CREEK
CARIBOU CREEK
MIDDLE FK EAST RIVER
PACK RIVER
LIGHTNING CR
SOUTH FK LAKE
IDAHO
MONTANA
SANDPOINT
PEND OREILLE LAKE
CLARK FORK
R2E R3E
T55N
T54N
US Dept of Agriculture
Blister Rust Control
Traced by M.L. Nelson
From Forest Service Map
Dec 1935 Spokane, Wash

ORGANIZATION CHART



STATE COOP.
Number of Camps - 2
Number of Men - 75

E.Q.-E.R.A.
Number of Camps - 4
Number of Men - 200

F.S.-REG.
Number of Camps - 6
Number of Men - 200

S.-C.C.C.
Number of Camps - 1
Number of Men - 50

F.-C.C.C.
Number of Camps - 5
Number of Men - 425

Total Number of Men on Blister Rust Work - 950



W 2601. White pine repraduction resulting from proper lagging practices. Area logged in 1927 taking all trees 12" in diameter. The cut was 30,000 board feet per acre. Seed trees were left ta a tatal of nat more than 2,400 baard feet per acre. Third ribes eradicatian performed in 1939 placed area an maintenance.



W 2426. This 60 to 80 year old stand of white pine was selectively logged on an experimental basis. Cadominant and dominant white pine were remaved to the extent af 8,390 baard feet per acre. Volume of white pine remaining per acre is 21,016 board feet. A high per cent af match stock and Na.1 lumber was secured. Ribes eradicatian was performed in 1934 and to date ribes regeneration due to logging has nat been a problem.

SUMMARY OF RIBES ERADICATION, 1939
KANIKSU OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Ribes Remaining Per Acre	
							Bushes	Live Stem
Open Reproduction	4,191	6,084	1,728	12,003	17,800	3,955,772	4	9
Dense Reproduction	69	767		836	1,248	134,196	4	11
Open Pole	2,918	1,071		3,989	4,996	624,338	4	8
Dense Pole	336	121	11	468	132	11,616	1	4
Open Mature	1,325	525	29	1,879	1,467	260,519	3	5
Dense Mature	65	365		430	162	12,309	1	4
Cutover	1,965	1,299		3,264	5,100	1,735,795	18	15
Brush		34	32	66	112	3,706	4	19
All Upland	10,869	10,266	1,800	22,935	31,017	6,738,251	6	9
Stream (Hand)	470	420	215	1,105	2,496	441,384	5	7
Stream (Machine)	140			140	1,031	70,000		
All Stream	610	420	215	1,245	3,527	511,384		
All Types	11,479	10,686	2,015	24,180	34,544	7,249,635	5	9

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man Days	Ribes	Bushes	Live Stem
Open Reproduction	4,191	8,197	2,210,786	1.96	528	5	10
Dense Reproduction	69	53	7,205	.77	104	4	9
Open Pole	2,918	4,085	554,134	1.40	190	4	8
Dense Pole	336	115	10,804	.34	32	1	5
Open Mature	1,325	1,111	195,066	.84	147	4	5
Dense Mature	65	80	5,198	1.23	80	3	7
Cutover	1,965	1,698	498,510	.86	254	15	10
All Upland	10,869	15,339	3,481,703	1.41	320	6	9
Stream (Hand)	470	1,506	332,654	3.20	708	6	9
Stream (Machine)	140	1,031	70,000	7.36	500		
All Stream	610	2,537	402,654	4.16	660		
All Types	11,479	17,876	3,884,357	1.56	338	6	9

TABLE NO. 3B - SECOND WORKING

Open Reproduction	6,084	7,607	1,631,047	1.25	268	4	8
Dense Reproduction	767	1,195	126,991	1.56	166	4	11
Open Pole	1,071	911	70,204	.85	66	4	7
Dense Pole	121	14	787	.12	7	3	2
Open Mature	525	331	65,003	.63	124	2	4
Dense Mature	365	82	7,111	.22	19	1	3
Cutover	1,299	3,402	1,237,285	2.62	952	21	13
Brush	34	77	2,948	2.26	87	9	37
All Upland	10,266	13,619	3,141,376	1.33	306	5	9
Stream (Hand)	420	652	90,289	1.55	215	5	6
All Types	10,686	14,271	3,231,665	1.34	302	5	9

TABLE NO. 3C - THIRD WORKING

Open Reproduction	1,728	1,996	113,939	1.16	66	4	7
Dense Pole	11	3	25	.27	2		
Open Mature	29	25	450	.86	16		
Brush	32	35	758	1.09	24	1	5
All Upland	1,800	2,059	115,172	1.14	64	4	7
Stream (Hand)	215	338	18,441	1.57	86	4	5
All Types	2,015	2,397	133,613	1.19	66	4	7

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1939
KANIKSU OPERATION

State	Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
						Man Days	Ribes	Bushes	Live Stem
Idaho	First	EQ-ERA	4,257	3,760	992,842	.88	233		
		FS-Reg.	2,230	2,560	229,728	1.15	103		
		FS-Bulldozer	140	1,031	70,000	7.36	500		
		State Coop.	591	1,001	224,999	1.69	382		
		F-CCC	330	1,229	397,215	3.72	1,204		
		Total	7,548	9,581	1,914,784	1.27	254		
	Second	EQ-ERA	1,794	3,980	1,359,531	2.22	758		
		FS-Reg.	1,974	1,586	112,517	.80	57		
		State Coop.	3,232	2,622	319,549	.81	99		
		F-CCC	1,513	3,422	803,641	2.26	531		
		S-CCC	294	1,055	462,252	3.59	1,572		
		Total	8,807	12,665	3,057,490	1.44	347		
	Third	EQ-ERA	1,691	2,325	126,521	1.37	75		
		State Coop.	324	72	7,092	.22	22		
		Total	2,015	2,397	133,613	1.19	66		
	All Workings	EQ-ERA	7,742	10,065	2,478,894	1.30	320		
		FS-Reg.	4,204	4,146	342,245	.99	81		
		FS-Bulldozer	140	1,031	70,000	7.36	500		
		State Coop.	4,147	3,695	551,640	.89	133		
		F-CCC	1,843	4,651	1,200,856	2.52	652		
		S-CCC	294	1,055	462,252	3.59	1,572		
		Total	18,370	24,643	5,105,887	1.34	278		
Washington	First	EQ-ERA	407	1,209	358,123	2.97	880		
		FS-Reg.	1,651	2,486	841,049	1.51	509		
		F-CCC	1,873	4,600	770,401	2.46	411		
		Total	3,931	8,295	1,969,573	2.11	501		
	Second	EQ-ERA	46	23	4,544	.50	99		
		FS-Reg.	1,018	685	79,447	.67	78		
		F-CCC	815	898	90,184	1.10	111		
		Total	1,879	1,606	174,175	.85	93		
	All Workings	EQ-ERA	453	1,232	362,667	2.72	801		
		FS-Reg.	2,669	3,171	920,496	1.19	345		
		F-CCC	2,688	5,498	860,585	2.05	320		
		Total	5,810	9,901	2,143,748	1.70	369		
Idaho and Washington	First	EQ-ERA	4,664	4,969	1,350,965	1.07	290	10	9
		FS-Reg.	3,881	5,046	1,070,777	1.30	276	3	10
		FS-Bulldozer	140	1,031	70,000	7.36	500		
		State Coop.	591	1,001	224,999	1.69	381	5	10
		F-CCC	2,203	5,829	1,167,616	2.65	530	5	12
		Total	11,479	17,876	3,884,357	1.56	338	7	10
	Second	EQ-ERA	1,840	4,003	1,364,075	2.18	741	10	10
		FS-Reg.	2,992	2,271	191,964	.76	64	2	4
		State Coop.	3,232	2,622	319,549	.81	99	5	8
		F-CCC	2,328	4,320	893,825	1.86	384	4	10
		S-CCC	294	1,055	462,252	3.59	1,572	26	50
		Total	10,686	14,271	3,231,665	1.34	302	5	9
	Third	EQ-ERA	1,691	2,325	126,521	1.37	75	4	7
		State Coop.	324	72	7,092	.22	22	3	3
		Total	2,015	2,397	133,613	1.19	66	4	7
	All Workings	EQ-ERA	8,195	11,297	2,841,561	1.38	347	9	9
		FS-Reg.	6,873	7,317	1,262,741	1.06	184	2	6
		FS-Bulldozer	140	1,031	70,000	7.36	500		
		State Coop.	4,147	3,695	551,640	.89	133	5	8
		F-CCC	4,531	10,149	2,061,441	2.24	455	5	11
		S-CCC	294	1,055	462,252	3.59	1,572	26	50
		Total	24,180	34,544	7,249,635	1.43	300	5	9

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1939
KANIKSU OPERATION

State	Working	Number of Acres Worked								
		By Forest Service		By Bureau of Entomology and Plant Quarantine			Total			
		Forest Service	Private	Forest Service	State	Private	Forest Service	State	Private	Total
Idaho	First	2,700		220	4,088	540	2,920	4,088	540	7,548
	Second	3,079	408		4,593	727	3,079	4,593	1,135	8,807
	Third				1,975	40		1,975	40	2,015
	Total	5,779	408	220	10,656	1,307	5,999	10,656	1,715	18,370
Washington	First	2,728	796	407			3,135		796	3,931
	Second	1,514	319	46			1,560		319	1,879
	Total	4,242	1,115	453			4,695		1,115	5,810
Total	First	5,428	796	627	4,088	540	6,055	4,088	1,336	11,479
	Second	4,593	727	46	4,593	727	4,639	4,593	1,454	10,686
	Third				1,975	40		1,975	40	2,015
	Total	10,021	1,523	673	10,656	1,307	10,694	10,656	2,830	24,180

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1939
KANIKSU OPERATION

Eradication Type	Average Results for All Areas			
	Acres in Checked Area	Acres Checked	Ribes Per Acre	
			Bushes	Live Stem
Open Reproduction	12,003	450	4	9
Dense Reproduction	836	33	4	11
Open Pole	3,989	157	4	8
Dense Pole	468	19	1	4
Open Mature	1,879	74	3	5
Dense Mature	430	17	1	4
Cutover	3,264	111	18	15
Brush	66	3	4	19
All Upland	22,935	864	6	9
Stream	1,245	181	5	7
All Types	24,180	1,045	5	9

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1939
KANIKSU OPERATION

Working	Eradication Type	Acres	Ribes by Species			Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	
First	Open Reproduction	4,191	463,381	1,741,365	6,040	2,210,786
	Dense Reproduction	69	6,456	749		7,205
	Open Pole	2,918	191,072	362,562	500	554,134
	Dense Pole	336	1,672	9,132		10,804
	Open Mature	1,325	105,717	89,349		195,066
	Dense Mature	65	5,166	32		5,198
	Cutover	1,965	247,026	251,484		498,510
	All Upland	10,869	1,020,490	2,454,673	6,540	3,481,703
	Stream	610	283,037	19,977	99,640	402,654
	All Types	11,479	1,303,527	2,474,650	106,180	3,884,357
Second	Open Reproduction	6,084	364,106	1,266,941		1,631,047
	Dense Reproduction	767	87,107	39,884		126,991
	Open Pole	1,071	13,679	56,525		70,204
	Dense Pole	121	718	69		787
	Open Mature	525	20,286	44,717		65,003
	Dense Mature	365	5,835	1,276		7,111
	Cutover	1,299	298,318	938,967		1,237,285
	Brush	34	2,948			2,948
	All Upland	10,266	792,997	2,348,379		3,141,376
	Stream	420	79,635	10,618	36	90,289
	All Types	10,686	872,632	2,358,997	36	3,231,665
Third	Open Reproduction	1,728	42,699	71,240		113,939
	Dense Pole	11	20	5		25
	Open Mature	29	150	300		450
	Brush	32	158	600		758
	All Upland	1,800	43,027	72,145		115,172
	Stream	215	15,773	2,668		18,441
	All Types	2,015	58,800	74,813		133,613
All Workings	Open Reproduction	12,003	870,186	3,079,546	6,040	3,955,772
	Dense Reproduction	836	93,563	40,633		134,196
	Open Pole	3,989	204,751	419,087	500	624,338
	Dense Pole	468	2,410	9,206		11,616
	Open Mature	1,879	126,153	134,366		260,519
	Dense Mature	430	11,001	1,308		12,309
	Cutover	3,264	545,344	1,190,451		1,735,795
	Brush	66	3,106	600		3,706
	All Upland	22,935	1,856,514	4,875,197	6,540	6,738,251
	Stream	1,245	378,445	33,263	99,676	511,384
	All Types	24,180	2,234,959	4,908,460	106,216	7,249,635

SUMMARY OF RIBES ERADICATION, 1923-1939
KANIKSU OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes
Open Reproduction	126,472	13,616	1,728	141,816	102,518	27,918,013
Dense Reproduction	22,524	2,318		24,842	13,806	1,888,859
Open Pole	93,067	9,507		102,574	36,116	5,034,104
Dense Pole	19,849	1,810	11	21,670	3,826	400,967
Open Mature	109,216	3,904	29	113,149	28,280	5,485,382
Dense Mature	30,255	601		30,856	3,782	433,532
Cutover	7,258	1,563		8,821	6,908	2,274,637
Brush	3,599	596	32	4,227	1,486	364,707
Burn	1,132			1,132	1,354	947,874
Subalpine	1,933	50		1,983	1,032	157,110
Meadow-Field	71	10		81	1	72
All Upland	415,376	33,975	1,800	451,151	199,109	44,905,257
Stream (Hand)	19,834	3,892	215	23,941	41,786	8,590,591
Stream (Slash)	576			576	4,994	288,000
Stream (Machine)	1,030			1,030	7,081	614,076
All Stream	21,440	3,892	215	25,547	53,861	9,492,667
All Types	436,816	37,867	2,015	476,698	252,970	54,397,924

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Ribes
Open Reproduction	126,472	86,674	25,336,958	.69	200
Dense Reproduction	22,524	11,655	1,700,022	.52	75
Open Pole	93,067	31,986	4,729,737	.34	51
Dense Pole	19,849	3,378	368,539	.17	19
Open Mature	109,216	26,093	5,224,625	.24	48
Dense Mature	30,255	3,584	415,459	.12	14
Cutover	7,258	3,405	1,026,260	.47	141
Brush	3,599	1,104	336,107	.31	93
Burn	1,132	1,354	947,874	1.20	837
Subalpine	1,933	1,019	156,522	.53	81
Meadow-Field	71				
All Upland	415,376	170,252	40,242,103	.41	97
Stream (Hand)	19,834	34,647	7,808,137	1.75	394
Stream (Slash)	576	4,994	288,000	8.67	500
Stream (Machine)	1,030	7,081	614,076	6.87	596
All Stream	21,440	46,722	8,710,213	2.18	406
All Types	436,816	216,974	48,952,316	.50	112

TABLE NO. 8B - SECOND WORKING

Open Reproduction	13,616	13,848	2,467,116	1.02	181
Dense Reproduction	2,318	2,151	188,837	.93	81
Open Pole	9,507	4,130	304,367	.43	32
Dense Pole	1,810	445	32,403	.25	18
Open Mature	3,904	2,162	260,307	.55	67
Dense Mature	601	198	18,073	.33	30
Cutover	1,563	3,503	1,248,377	2.24	799
Brush	596	347	27,842	.58	47
Subalpine	50	13	588	.26	12
Meadow-Field	10	1	72	.10	7
All Upland	33,975	26,798	4,547,982	.79	134
Stream (Hand)	3,892	6,801	764,013	1.75	196
All Types	37,867	33,599	5,311,995	.89	140

TABLE NO. 8C - THIRD WORKING

Open Reproduction	1,728	1,996	113,939	1.16	66
Dense Pole	11	3	25	.27	2
Open Mature	29	25	450	.86	16
Brush	32	35	758	1.09	24
All Upland	1,800	2,059	115,172	1.14	64
Stream	215	338	18,441	1.57	86
All Types	2,015	2,397	133,613	1.19	66

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1923-1939
KANIKSU OPERATION

State	Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Ribes
Idaho	First	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	8,054	14,200	2,207,045	1.76	274
		FS-NIRA	72,135	23,866	6,432,376	.33	89
		EQ-ERA	75,121	39,895	7,370,122	.53	98
		FS-ERA	15,521	9,922	1,851,208	.64	119
		Cooperative	106,308	29,055	8,276,804	.27	78
		F-CCC	54,424	36,378	6,379,138	.67	117
		S&P-CCC	112	748	209,356	6.68	1,869
		Total	350,471	160,908	33,792,738	.46	96
	Second	FS-Reg.	1,974	1,586	112,517	.80	57
		FS-NIRA	8,544	2,051	292,658	.24	34
		EQ-ERA	9,722	10,045	2,339,592	1.03	241
		FS-ERA	1,181	762	76,228	.65	65
		Cooperative	3,843	3,015	354,727	.78	92
		F-CCC	3,577	7,722	985,875	2.16	276
		S&P-CCC	2,906	2,548	615,998	.88	212
		Total	31,747	27,729	4,777,595	.87	150
	Third	EQ-ERA	1,691	2,325	126,521	1.37	75
		Cooperative	324	72	7,092	.22	22
		Total	2,015	2,397	133,613	1.19	66
	All Workings	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	10,028	15,786	2,319,562	1.57	231
		FS-NIRA	80,679	25,917	6,725,034	.32	83
		EQ-ERA	86,534	52,265	9,836,235	.60	114
		FS-ERA	16,702	10,684	1,927,436	.64	115
		Cooperative	110,475	32,142	8,638,623	.29	78
		F-CCC	58,001	44,100	7,365,013	.76	127
		S&P-CCC	3,018	3,296	825,354	1.09	273
		Total	384,233	191,034	38,703,946	.50	101
Washington	First	FS-Reg.	2,235	4,723	1,545,525	2.11	692
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	34,417	12,708	3,858,496	.37	112
		EQ-ERA	3,328	5,844	2,190,917	1.76	658
		F-CCC	19,632	21,080	3,216,382	1.07	164
		Total	86,345	56,066	15,159,578	.65	176
	Second	FS-Reg.	1,018	685	79,447	.67	78
		EQ-ERA	1,256	1,158	142,803	.92	114
		FS-ERA	1,949	1,678	154,764	.86	79
		F-CCC	1,897	2,349	157,386	1.24	83
		Total	6,120	5,870	534,400	.96	87
	All Workings	FS-Reg.	3,253	5,408	1,624,972	1.66	500
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	34,417	12,708	3,858,496	.37	112
		EQ-ERA	4,584	7,002	2,333,720	1.53	509
		FS-ERA	1,949	1,678	154,764	.86	79
		F-CCC	21,529	23,429	3,373,768	1.09	157
		Total	92,465	61,936	15,693,978	.67	170
Idaho and Washington	First	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	10,289	18,923	3,752,570	1.84	365
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	106,552	36,574	10,290,872	.34	97
		EQ-ERA	78,449	45,739	9,561,039	.58	122
		FS-ERA	15,521	9,922	1,851,208	.64	119
		Cooperative	106,308	29,055	8,276,804	.27	78
		F-CCC	74,056	57,458	9,595,520	.78	130
		S&P-CCC	112	748	209,356	6.68	116
		Total	436,816	216,974	48,952,316	.50	112
	Second	FS-Reg.	2,992	2,271	191,964	.76	64
		FS-NIRA	8,544	2,051	292,658	.24	34
		EQ-ERA	10,978	11,203	2,482,395	1.02	226
		FS-ERA	3,130	2,440	230,992	.78	74
		Cooperative	3,843	3,015	354,727	.78	92
		F-CCC	5,474	10,071	1,143,261	1.84	209
		S&P-CCC	2,906	2,548	615,998	.88	212
		Total	37,867	33,599	5,311,995	.89	140
	Third	EQ-ERA	1,691	2,325	126,521	1.37	75
		Cooperative	324	72	7,092	.22	22
		Total	2,015	2,397	133,613	1.19	66
	All Workings	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	13,281	21,194	3,944,534	1.60	297
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	115,096	38,625	10,583,530	.34	92
		EQ-ERA	91,118	59,267	12,169,955	.65	134
		FS-ERA	18,651	12,362	2,082,200	.66	112
		Cooperative	110,475	32,142	8,638,623	.29	78
		F-CCC	79,530	67,529	10,738,781	.85	135
		S&P-CCC	3,018	3,296	825,354	1.09	273
		Total	476,698	252,970	54,397,924	.53	114

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERAL C TION, 1923-1939
KANIKSU OPERATION

State	Working	Number of Acres Worked by Ownership Classes					
		Federal			State	Private	Total
		Forest Service	Public Domain	Total			
Idaho	First	179,035	54	179,089	105,464	65,918	350,471
	Second	14,868		14,868	11,455	5,424	31,747
	Third				1,975	40	2,015
	All Workings	193,903	54	193.957	118,894	71,382	384,233
Washington	First	51,925		51,925	2,030	32,390	86,345
	Second	4,322		4,322		1,798	6,120
	All Workings	56,247		56,247	2,030	34,188	92,465
Idaho and Washington	First	230,960	54	231,014	107,494	98,308	436,816
	Second	19,190		19,190	11,455	7,222	37,867
	Third				1,975	40	2,015
	All Workings	250,150	54	250,204	120,924	105,570	476,698

TABLE NO. 11

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1939
KANIKSU OPERATION

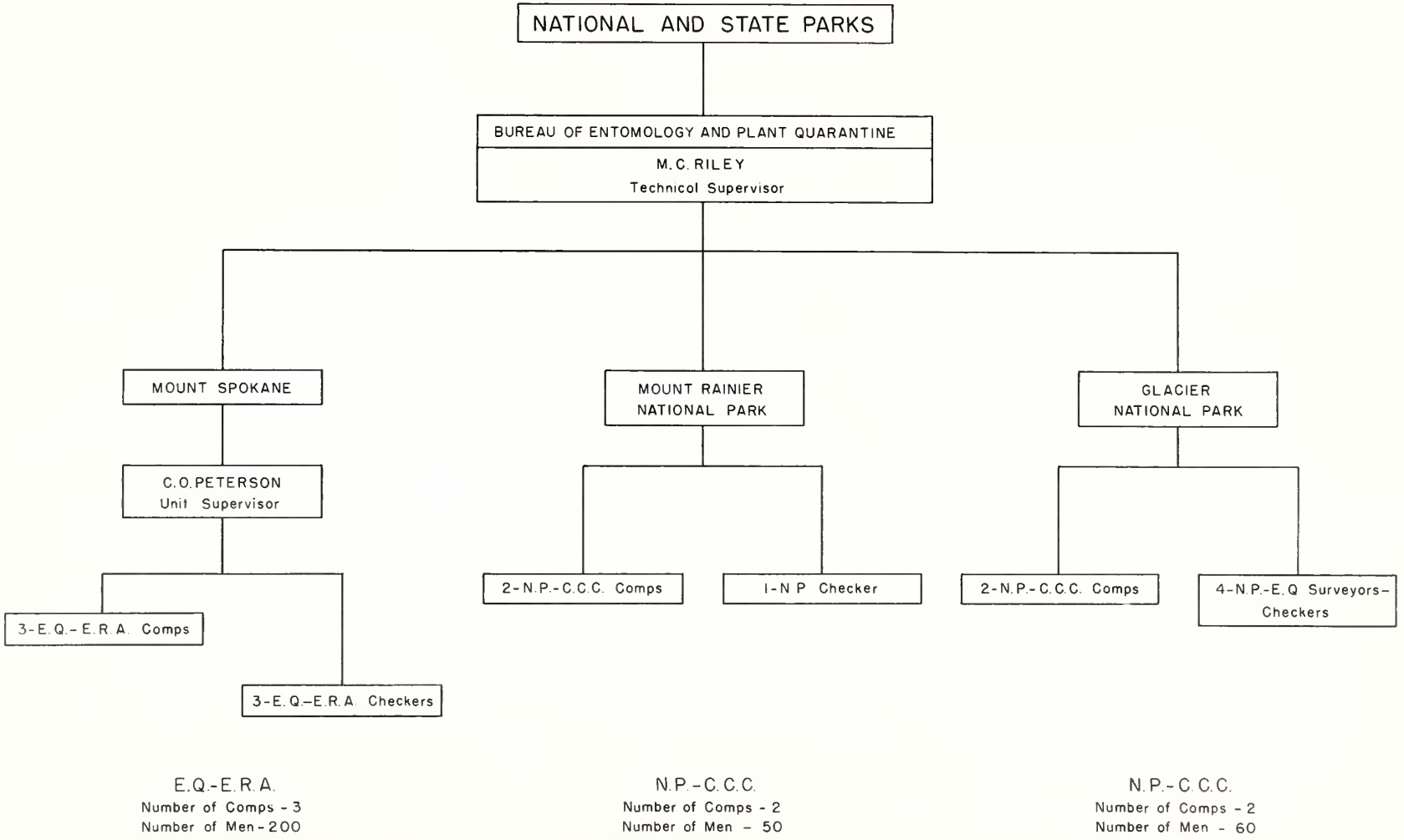
State	Ownership Class	Number of Acres		
		Worked	Unworked	Total
Idaho	Forest Service	179,035	75,850	254,885
	Public Domain	54	506	560
	Sub-total Federal	179,089	76,356	255,445
	State	105,464	23,006	128,470
	Private	65,918	51,792	117,710
	Total	350,471	151,154	501,625
Washington	Forest Service	51,925	39,965	91,890
	State	2,030	2,080	4,110
	Private	32,390	13,255	45,645
	Total	86,345	55,300	141,645
Idaho and Washington	Forest Service	230,960	115,815	346,775
	Public Domain	54	506	560
	Sub-total Federal	231,014	116,321	347,335
	State	107,494	25,086	132,580
	Private	98,308	65,047	163,355
	Total	436,816	206,454	643,270

TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1923-1939
KANIKSU OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	Ribes irriguum	Ribes acerifolium	
First	Open Reproduction	126,472	6,845,751	18,330,154	158,106	2,947		25,336,958
	Dense Reproduction	22,524	1,234,765	398,962	66,295			1,700,022
	Open Pole	93,067	2,178,843	2,339,741	186,047	21,192	3,914	4,729,737
	Dense Pole	19,849	235,725	109,904	22,388	522		368,539
	Open Mature	109,216	3,595,135	1,504,741	122,722		2,027	5,224,625
	Dense Mature	30,255	295,808	87,912	31,739			415,459
	Cutover	7,258	469,338	513,702	43,220			1,026,260
	Brush	3,599	68,387	203,158	64,562			336,107
	Burn	1,132	153,516	790,402	3,956			947,874
	Subalpine	1,933	116,392	40,111	19			156,522
	Meadow-Field	71						
	All Upland	415,376	15,193,660	24,318,787	699,054	24,661	5,941	40,242,103
	Stream	21,440	4,443,573	393,234	3,853,822		19,584	8,710,213
	All Types	436,816	19,637,233	24,712,021	4,552,876	24,661	25,525	48,952,316
Second	Open Reproduction	13,616	654,194	1,790,837	22,085			2,467,116
	Dense Reproduction	2,318	133,332	53,987	1,518			188,837
	Open Pole	9,507	149,447	147,073	7,847			304,367
	Dense Pole	1,810	27,173	2,754	2,476			32,403
	Open Mature	3,904	129,988	127,103	3,216			260,307
	Dense Mature	601	13,802	3,613	658			18,073
	Cutover	1,563	300,921	939,237	8,219			1,248,377
	Brush	596	15,641	11,326	875			27,842
	Subalpine	50	461	127				588
	Meadow-Field	10	72					72
	All Upland	33,975	1,425,031	3,076,057	46,894			4,547,982
	Stream	3,892	335,558	34,967	393,488			764,013
	All Types	37,867	1,760,589	3,111,024	440,382			5,311,995
Third	Open Reproduction	1,728	42,699	71,240				113,939
	Dense Pole	11	20	5				25
	Open Mature	29	150	300				450
	Brush	32	158	600				758
	All Upland	1,800	43,027	72,145				115,172
	Stream	215	15,773	2,668				18,441
	All Types	2,015	58,800	74,813				133,613
All Workings	Open Reproduction	141,816	7,542,644	20,192,231	180,191	2,947		27,918,013
	Dense Reproduction	24,842	1,368,097	452,949	67,813			1,888,859
	Open Pole	102,574	2,328,290	2,486,814	193,894	21,192	3,914	5,034,104
	Dense Pole	21,670	262,918	112,663	24,864	522		400,967
	Open Mature	113,149	3,725,273	1,632,144	125,938		2,027	5,485,382
	Dense Mature	30,856	309,610	91,525	32,397			433,532
	Cutover	8,821	770,259	1,452,939	51,439			2,274,637
	Brush	4,227	84,186	215,084	65,437			364,707
	Burn	1,132	153,516	790,402	3,956			947,874
	Subalpine	1,983	116,853	40,238	19			157,110
	Meadow-Field	81	72					72
	All Upland	451,151	16,661,713	27,466,989	745,948	24,661	5,941	44,905,257
	Stream	25,547	4,794,904	430,869	4,247,310		19,584	9,492,667
	All Types	476,698	21,456,622	27,897,858	4,993,258	24,661	25,525	54,397,924

ORGANIZATION CHART



E.Q.-E.R.A.
Number of Comps - 3
Number of Men - 200

N.P.-C.C.C.
Number of Comps - 2
Number of Men - 50

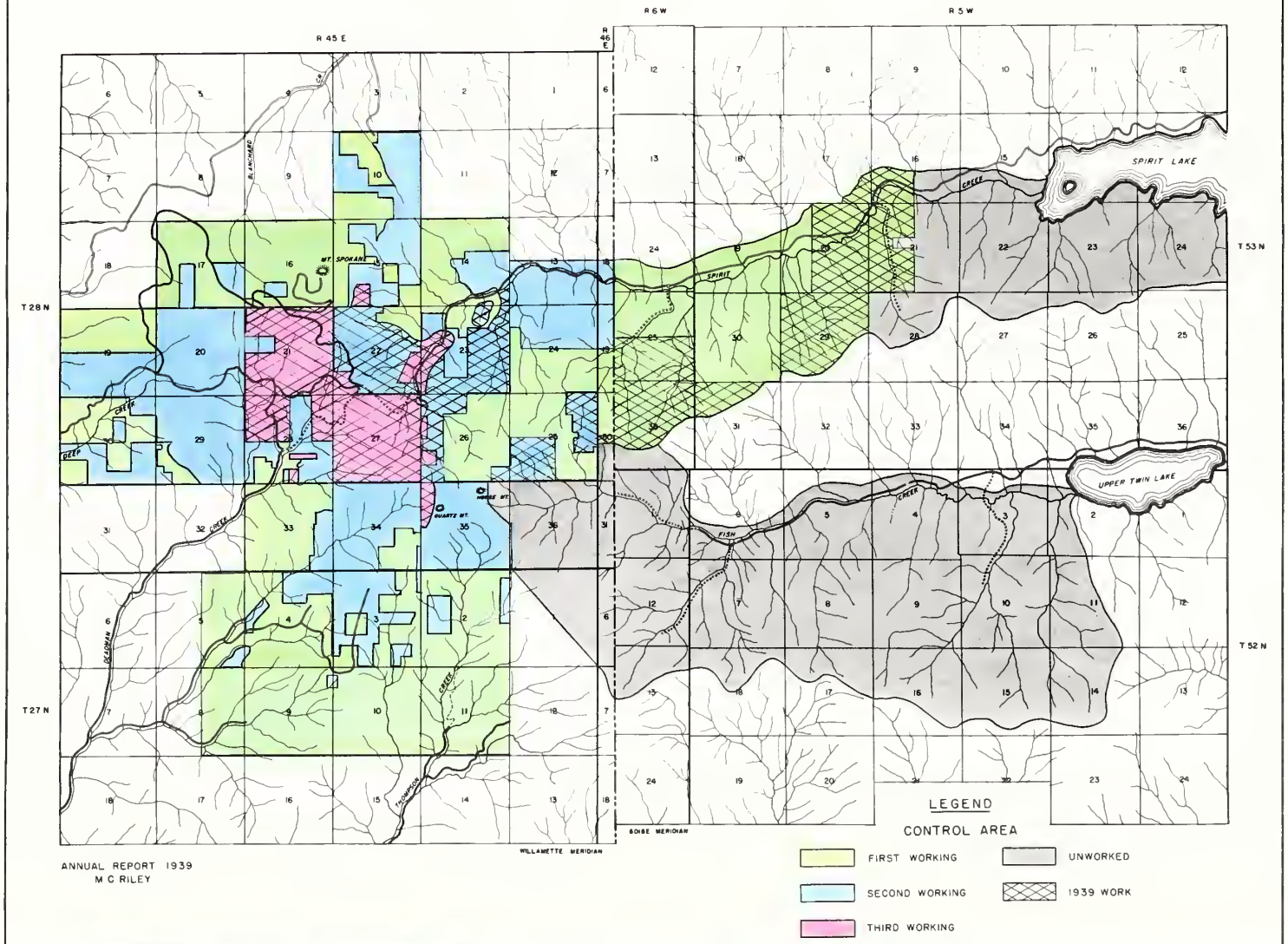
N.P.-C.C.C.
Number of Comps - 2
Number of Men - 60

MT. SPOKANE OPERATION

BLISTER RUST CONTROL WORKING AREA

SCALE

WILLAMETTE AND BOISE MERIDIANS



ANNUAL REPORT 1939
M C RILEY

SUMMARY OF RIBES ERADICATION, 1939
MOUNT SPOKANE OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Ribes Remaining Per Acre	
							Bushes	Live Stem
Open Reproduction	1,559	295	875	2,729	5,659	2,413,634	6.4	7.8
Dense Reproduction	41	15	69	125	195	87,733	4.3	2.5
Open Pole	609	102	426	1,137	1,581	618,833	7.8	8.6
Open Mature		214	122	336	182	45,723	1.8	2.4
Cutover		614	138	752	1,019	651,629	12.7	5.0
Brush			145	145	87	15,358	1.0	2.0
Subalpine		9	88	97	44	6,849		
All Upland	2,209	1,249	1,863	5,321	8,767	3,839,759	7.5	6.6
Stream (Hand)	56			56	325	68,331	5.0	4.4
All Types	2,265	1,249	1,863	5,377	9,092	3,908,090	7.4	6.6

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man Days	Ribes	Bushes	Live Stem
Open Reproduction	1,559	4,633	2,085,896	2.97	1,338	6.9	11.4
Dense Reproduction	41	95	22,421	2.32	547	3.6	2.1
Open Pole	609	1,268	475,801	2.08	781	8.0	10.9
All Upland	2,209	5,996	2,584,118	2.71	1,170	7.0	11.0
Stream (Hand)	56	325	68,331	5.80	1,220	5.0	4.4
All Types	2,265	6,321	2,652,449	2.79	1,171	6.9	10.5

TABLE NO. 3B - SECOND WORKING

Open Reproduction	295	270	110,974	.92	376	18.6	8.6
Dense Reproduction	15	30	36,416	2.00	2,428	1.2	
Open Pole	102	73	71,940	.72	705	38.0	4.0
Open Mature	214	80	18,805	.37	88	1.8	2.4
Cutover	614	849	598,089	1.38	974	13.4	4.2
Subalpine	9	5	1,501	.56	167		
All Types	1,249	1,307	837,725	1.05	671	11.5	3.7

TABLE NO. 3C - THIRD WORKING

Open Reproduction	875	756	216,764	.86	248	5.1	4.4
Dense Reproduction	69	70	28,896	1.01	419	5.7	3.3
Open Pole	426	240	71,092	.56	167	4.3	7.5
Open Mature	122	102	26,918	.84	221	5.8	6.2
Cutover	138	170	53,540	1.23	388	11.2	6.9
Brush	145	87	15,358	.60	106	1.0	2.0
Subalpine	88	39	5,348	.44	61		
All Types	1,863	1,464	417,916	.79	224	5.7	5.4

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1939
MOUNT SPOKANE OPERATION

State	Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
						Man Days	Ribes	Bushes	Live Stem
Idaho	First	EQ-ERA	2,265	6,321	2,652,449	2.79	1,171	6.9	10.5
Washington	Second	EQ-ERA	1,249	1,307	837,725	1.05	671	11.5	3.7
	Third	EQ-ERA	1,863	1,464	417,916	.79	224	5.7	5.4
	All Workings	EQ-ERA	3,112	2,771	1,255,641	.89	404	7.7	4.8
Idaho and Washington	First	EQ-ERA	2,265	6,321	2,652,449	2.79	1,171	6.9	10.5
	Second	EQ-ERA	1,249	1,307	837,725	1.05	671	11.5	3.7
	Third	EQ-ERA	1,863	1,464	417,916	.79	224	5.7	5.4
	All Workings	EQ-ERA	5,377	9,092	3,908,090	1.69	727	7.4	6.6

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1939
MOUNT SPOKANE OPERATION

State	Working	Number of Acres Worked by Bureau of Entomology and Plant Quarantine					
		Federal			State	Private	Total
		Forest Service	Public Domain	Total			
Idaho	First	40	80	120	808	1,337	2,265
Washington	Second				279	970	1,249
	Third				1,041	822	1,863
	Total				1,320	1,792	3,112
Total	First	40	80	120	808	1,337	2,265
	Second				279	970	1,249
	Third				1,041	822	1,863
	Total	40	80	120	2,128	3,129	5,377

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1939
MOUNT SPOKANE OPERATION

Eradication Type	Average Results for All Areas			
	Acres in Checked Area	Acres Checked	Ribes per Acre	
			Bushes	Live Stem
Open Reproduction	1,631	65.2	6.4	7.8
Dense Reproduction	125	5.1	4.3	2.5
Open Pole	601	24.0	7.8	8.6
Open Mature	295	12.0	1.8	2.4
Cutover	752	20.1	12.7	5.0
Brush	25	1.0	1.0	2.0
Subalpine	33	1.3		
All Upland	3,462	128.7	7.5	6.6
Stream (Hand)	56	4.5	5.0	4.4
All Types	3,518	133.2	7.4	6.6

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1939
MOUNT SPOKANE OPERATION

Working	Eradication Type	Acres	Ribes by Species			Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	
First	Open Reproduction	1,559	709,197	1,373,719	2,980	2,085,896
	Dense Reproduction	41	15,808	6,613		22,421
	Open Pole	609	206,609	269,192		475,801
	All Upland	2,209	931,614	1,649,524	2,980	2,584,118
	Stream	56	48,063	7	20,261	68,331
	All Types	2,265	979,677	1,649,531	23,241	2,652,449
Second	Open Reproduction	295	45,820	65,154		110,974
	Dense Reproduction	15	36,063	353		36,416
	Open Pole	102	29,579	42,361		71,940
	Open Mature	214	9,066	9,739		18,805
	Cutover	614	295,982	302,107		598,089
	Subalpine	9	600	901		1,501
	All Types	1,249	417,110	420,615		837,725
Third	Open Reproduction	875	113,652	103,112		216,764
	Dense Reproduction	69	23,526	5,370		28,896
	Open Pole	426	29,788	41,304		71,092
	Open Mature	122	8,682	18,236		26,918
	Cutover	138	40,888	12,652		53,540
	Brush	145	4,238	11,120		15,358
	Subalpine	88	2,510	2,838		5,348
	All Types	1,863	223,284	194,632		417,916
All Workings	Open Reproduction	2,729	868,669	1,541,985	2,980	2,413,634
	Dense Reproduction	125	75,397	12,336		87,733
	Open Pole	1,137	265,976	352,857		618,833
	Open Mature	336	17,748	27,975		45,723
	Cutover	752	336,870	314,759		651,629
	Brush	145	4,238	11,120		15,358
	Subalpine	97	3,110	3,739		6,849
	All Upland	5,321	1,572,008	2,264,771	2,980	3,839,759
	Stream	56	48,063	7	20,261	68,331
	All Types	5,377	1,620,071	2,264,778	23,241	3,908,090

SUMMARY OF RIBES ERADICATION, 1935-1939
MOUNT SPOKANE OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes
Open Reproduction	7,444	3,080	988	11,512	25,341	7,773,592
Dense Reproduction	376	215	69	660	952	260,655
Open Pole	8,334	3,150	479	11,963	12,951	3,444,905
Dense Pole	623	159		782	402	69,887
Open Mature	1,076	678	131	1,885	3,482	723,229
Dense Mature	735	102		837	185	34,017
Cutover	526	760	186	1,472	2,015	972,489
Brush	1,924	601	160	2,685	2,974	393,034
Subalpine	515	181	88	784	502	100,944
All Upland	21,553	8,926	2,101	32,580	48,804	13,772,652
Stream (Hand)	458	214		672	2,812	911,561
All Types	22,011	9,140	2,101	33,252	51,616	14,684,213

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis	
				Man Days	Ribes
Open Reproduction	7,444	21,098	6,808,613	2.83	915
Dense Reproduction	376	592	170,078	1.57	452
Open Pole	8,334	10,107	2,872,908	1.21	345
Dense Pole	623	317	58,388	.51	94
Open Mature	1,076	2,667	542,489	2.48	504
Dense Mature	735	165	33,155	.22	45
Cutover	526	710	236,946	1.35	450
Brush	1,924	1,923	289,058	1.00	150
Subalpine	515	334	85,746	.65	166
All Upland	21,553	37,913	11,097,181	1.76	515
Stream (Hand)	458	2,456	853,745	5.36	1,864
All Types	22,011	40,369	11,950,926	1.83	543

TABLE NO. 8B - SECOND WORKING

Open Reproduction	3,080	3,391	728,138	1.10	236
Dense Reproduction	215	290	61,681	1.35	287
Open Pole	3,150	2,585	499,980	.82	159
Dense Pole	159	85	11,499	.53	72
Open Mature	678	706	153,668	1.04	227
Dense Mature	102	20	862	.20	9
Cutover	760	1,092	669,650	1.44	881
Brush	601	947	88,180	1.58	147
Subalpine	181	129	9,850	.71	54
All Upland	8,926	9,245	2,223,408	1.04	249
Stream (Hand)	214	356	57,816	1.66	270
All Types	9,140	9,601	2,281,224	1.05	250

TABLE NO. 8C - THIRD WORKING

Open Reproduction	988	852	236,841	.86	240
Dense Reproduction	69	70	28,996	1.01	419
Open Pole	479	259	72,117	.54	151
Open Mature	131	109	27,072	.83	207
Cutover	186	213	65,993	1.15	355
Brush	160	104	15,796	.65	99
Subalpine	88	39	5,348	.44	61
All Types	2,101	1,646	452,063	.78	215

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1935-1939
MOUNT SPOKANE OPERATION

State	Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Ribes
Idaho	First	EQ-ERA	3,916	11,032	4,067,400	2.82	1,039
Washington	First	EQ-ERA	18,095	29,337	7,883,526	1.62	436
	Second	EQ-ERA	9,140	9,601	2,281,224	1.05	250
	Third	EQ-ERA	2,101	1,646	452,063	.78	215
	All Workings	EQ-ERA	29,336	40,584	10,616,813	1.38	362
Idaho and Washington	First	EQ-ERA	22,011	40,369	11,950,926	1.83	543
	Second	EQ-ERA	9,140	9,601	2,281,224	1.05	250
	Third	EQ-ERA	2,101	1,646	452,063	.78	215
	All Workings	EQ-ERA	33,252	51,616	14,684,213	1.55	442

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1935-1939
MOUNT SPOKANE OPERATION

State	Working	Number of Acres Worked by Ownership Classes					
		Federal			State	Private	Total
		Forest Service	Public Domain	Total			
Idaho	First	120	80	200	1,167	2,549	3,916
Washington	First		315	315	4,752	13,028	18,095
	Second		60	60	2,943	6,137	9,140
	Third				1,194	907	2,101
	Total		375	375	8,889	20,072	29,336
Total	First	120	395	515	5,919	15,577	22,011
	Second		60	60	2,943	6,137	9,140
	Third				1,194	907	2,101
	Total	120	455	575	10,056	22,621	33,252

TABLE NO. 11

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1935-1939
MOUNT SPOKANE OPERATION

State	Ownership Class	Number of Acres		
		Worked	Unworked	Total
Idaho	Forest Service	120	270	390
	Public Domain	80	505	585
	Sub-total Federal	200	775	975
	State	1,167	558	1,725
	Private	2,549	10,021	12,570
	Total	3,916	11,354	15,270
Washington	Public Domain	315		315
	State	4,752	1,953	6,705
	Private	13,028	557	13,585
	Total	18,095	2,510	20,605
Total	Forest Service	120	270	390
	Public Domain	395	505	900
	Sub-total Federal	515	775	1,290
	State	5,919	2,511	8,430
	Private	15,577	10,578	26,155
	Total	22,011	13,864	35,875

TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1935-1939
MOUNT SPOKANE OPERATION

Working	Eradication Type	Acres	Ribes by Species			Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	
First	Open Reproduction	7,444	1,978,997	4,816,951	12,665	6,808,613
	Dense Reproduction	376	145,551	24,527		170,078
	Open Pole	8,334	1,360,598	1,512,210		2,872,808
	Dense Pole	623	34,394	23,994		58,388
	Open Mature	1,076	259,455	283,034		542,489
	Dense Mature	735	11,281	21,874		33,155
	Cutover	526	136,659	100,187		236,846
	Brush	1,924	85,890	203,168		289,058
	Subalpine	515	46,423	39,323		85,746
	All Upland	21,553	4,059,248	7,025,268	12,665	11,097,181
	Stream	458	671,674	67,218	114,853	853,745
	All Types	22,011	4,730,922	7,092,486	127,518	11,950,926
Second	Open Reproduction	3,080	196,447	531,691		728,138
	Dense Reproduction	215	52,484	9,197		61,681
	Open Pole	3,150	206,848	293,032		499,880
	Dense Pole	159	5,771	5,728		11,499
	Open Mature	678	47,746	105,922		153,668
	Dense Mature	102	463	399		862
	Cutover	760	340,267	329,383		669,650
	Brush	601	40,465	47,715		88,180
	Subalpine	181	4,970	4,880		9,850
	All Upland	8,926	895,461	1,327,947		2,223,408
	Stream	214	54,562	3,254		57,816
	All Types	9,140	950,023	1,331,201		2,281,224
Third	Open Reproduction	988	123,213	113,628		236,841
	Dense Reproduction	69	23,526	5,370		28,896
	Open Pole	479	30,414	41,703		72,117
	Open Mature	131	8,736	18,336		27,072
	Cutover	186	49,466	16,527		65,993
	Brush	160	4,378	11,418		15,796
	Subalpine	88	2,510	2,838		5,348
	All Types	2,101	242,243	209,820		452,063
All Workings	Open Reproduction	11,512	2,298,657	5,462,270	12,665	7,773,592
	Dense Reproduction	660	221,561	39,094		260,655
	Open Pole	11,963	1,597,860	1,846,945		3,444,805
	Dense Pole	782	40,165	29,722		69,887
	Open Mature	1,885	315,937	407,292		723,229
	Dense Mature	837	11,744	22,273		34,017
	Cutover	1,472	526,392	446,097		972,489
	Brush	2,685	130,733	262,301		393,034
	Subalpine	784	53,903	47,041		100,944
	All Upland	32,580	5,196,952	8,563,035	12,665	13,772,652
	Stream	672	726,236	70,472	114,853	911,561
	All Types	33,252	5,923,188	8,633,507	127,518	14,684,213

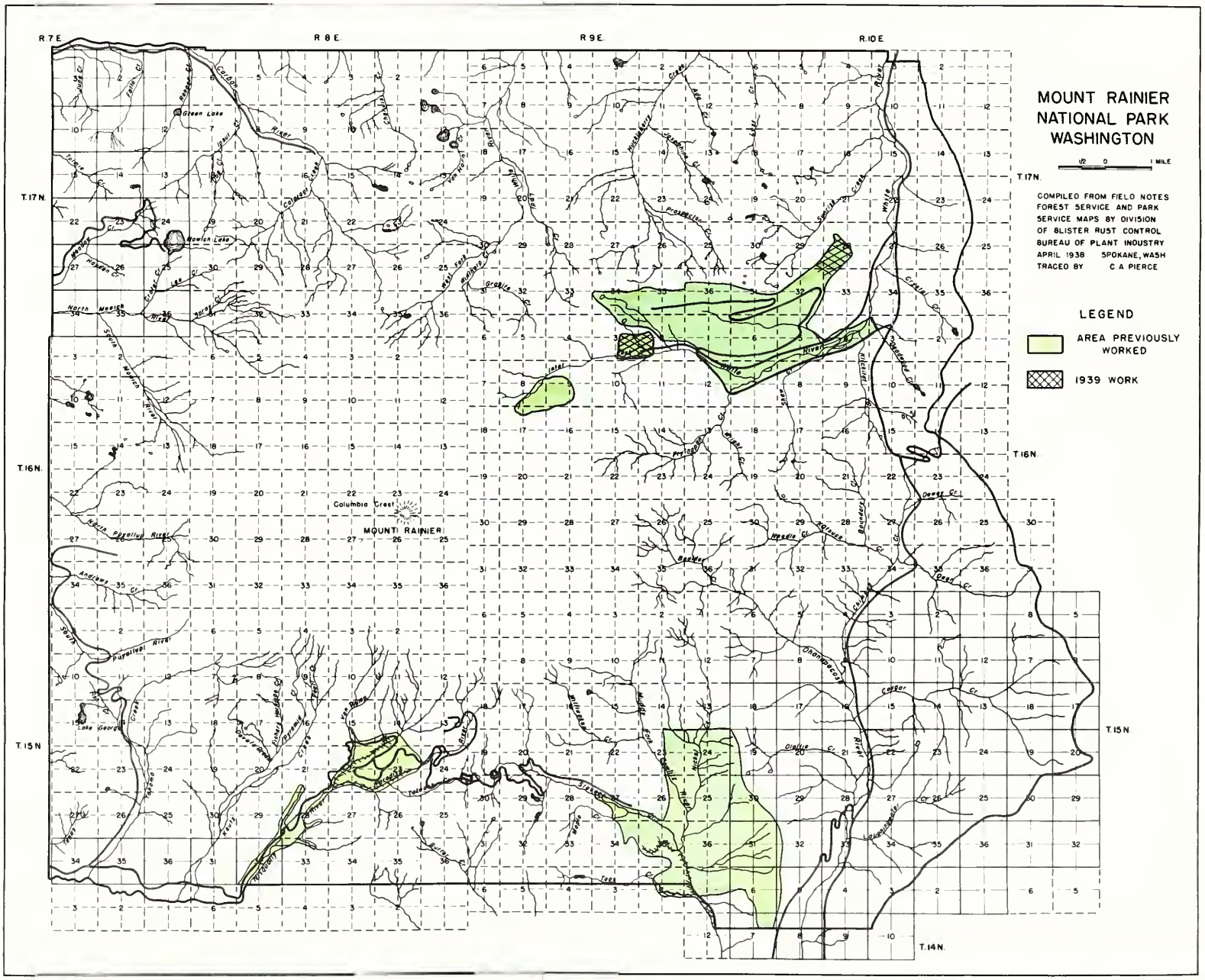

MOUNT RAINIER
NATIONAL PARK
WASHINGTON
½ 0 1 MILE
COMPILED FROM FIELD NOTES
FOREST SERVICE AND PARK
SERVICE MAPS BY DIVISION
OF BLISTER RUST CONTROL
BUREAU OF PLANT INDUSTRY
APRIL 1938 SPOKANE, WASH
TRACED BY C A PIERCE
LEGEND
AREA PREVIOUSLY WORKED
1939 WORK
R 7 E.
R 8 E.
R 9 E.
R.10 E.
T.17 N.
T.16 N.
T.15 N.
T.14 N.
MOUNT RAINIER
Columbia Crest
Green Lake
Mowich Lake
Lake George
Ohanapecosh
North Puyallup River
South Puyallup River
Carbon River
Mowich River
Ipsut Creek
Tahoma Creek
Kautz Creek
Nisqually River
Paradise River
Stevens Creek
Owyac Creek
Cougar Creek
Clear Fork
Laughingwater Creek
Indian Creek
Sunset Park
Longmire

TABLE NO. 2

SUMMARY OF RIBES ERADICATION, 1930-1939
MOUNT RAINIER NATIONAL PARK

Working	Area	Eradication Type	Acres	Effective Man Days	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes bracteosum	Ribes watsonianum	Ribes laxiflorum	Ribes acerifolium	Ribes sanguineum	Ribes triste	Total Ribes	Per Acre Basis: Man Days	Ribes
First	Longmire	Open Reproduction	274	397	40,281		1,101		5,409	5,804			52,595	1.45	192
		Stream	626	1,202	165,687		97,774		53,899	2,838	16		340,214	1.92	543
		All Types	900	1,599	225,968		98,875		59,308	8,642	16		392,809	1.78	436
	Stevens Canyon	Open Reproduction	2,351	218	28,071		15,986				7,915		51,972	.09	22
		Open Pole	704	38	176		1,052				16		1,244	.05	2
		All Upland	3,055	256	28,247		17,038				7,931		53,216	.08	17
		Stream	1,192	4,741	72,360	2,055	440,386		914	11	3,959		519,685	3.98	436
		All Types	4,247	4,997	100,607	2,055	457,424		914	11	11,890		572,901	1.18	135
	White River	Open Reproduction	66	50	6,869	239	21	1,133	550	194			9,006	.76	136
		Open Pole	1,870	2,087	173,780	69,529	539	139,238	1,189	10,801	91	744	395,911	1.12	212
		Open Mature	322	264	27,327	12,847			5	45			40,224	.82	125
		All Upland	2,258	2,401	207,976	82,615	560	140,371	1,744	11,040	91	744	445,141	1.06	197
		Stream	423	744	162,856	1,510	4,869	242	8,820	188	98	8	178,591	1.76	422
		All Types	2,681	3,145	370,832	84,125	5,429	140,613	10,564	11,228	189	752	623,732	1.17	233
	Starbo	Open Reproduction	48	21	68	7		7		2,305			2,387	.44	50
		Open Pole	332	262	11,276	6,131		6,723	3,221	16,658			44,009	.79	133
		All Upland	380	283	11,344	6,138		6,730	3,221	18,963			46,396	.74	122
		Stream	46	46	2,663	575		476	546	409			4,669	1.00	102
		All Types	426	329	14,007	6,713		7,206	3,767	19,372			51,065	.77	120
	All Areas	Open Reproduction	2,739	686	75,289	246	17,108	1,140	5,959	8,303	7,915		115,960	.25	42
		Open Pole	2,906	2,387	185,232	75,660	1,591	145,961	4,410	27,459	107	744	441,164	.82	152
		Open Mature	322	264	27,327	12,847			5	45			40,224	.82	125
		All Upland	5,967	3,337	287,848	88,753	18,699	147,101	10,374	35,807	8,022	744	597,348	.56	100
		Stream	2,287	6,733	423,566	4,140	543,029	718	64,179	3,446	4,073	8	1,043,159	2.94	456
		All Types	8,254	10,070	711,414	92,893	561,728	147,819	74,553	39,253	12,095	752	1,640,507	1.22	199
Second	Longmire	Open Reproduction	203	97	9,744		1,101						10,845	.48	53
		Stream	614	526	19,977		23,196		2,394	1,426	50		47,043	.86	77
		All Types	817	623	29,721		24,297		2,394	1,426	50		57,888	.76	71
	Stevens Canyon	Stream	471	1,286	41,189		116,144				6		157,339	2.73	334
	White River	Open Reproduction	66	12	221			77					298	.18	5
		Open Pole	1,914	1,573	36,284	14,297	2,176	6,849	16,095	33			75,734	.82	40
		Open Mature	322	47	1,278	2,011							3,289	.15	10
		All Upland	2,302	1,632	37,783	16,308	2,176	6,926	16,095	33			79,321	.71	35
		Stream	394	657	32,748		154		5				32,907	1.67	84
		All Types	2,696	2,289	70,531	16,308	2,330	6,926	16,100	33			112,228	.85	42
	All Areas	Open Reproduction	269	109	9,965		1,101	77					11,143	.41	41
		Open Pole	1,914	1,573	36,284	14,297	2,176	6,849	16,095	33			75,734	.82	40
		Open Mature	322	47	1,278	2,011							3,289	.15	10
		All Upland	2,505	1,729	47,527	16,308	3,277	6,926	16,095	33			90,166	.69	36
		Stream	1,479	2,469	93,914		139,494		2,399	1,426	56		237,289	1.67	160
		All Types	3,984	4,198	141,441	16,308	142,771	6,926	18,494	1,459	56		327,455	1.05	82
Third	Longmire	Stream	393	226	9,451		1,173		316		6		10,946	.58	28
	Stevens Canyon	Stream	37	108			1,733						1,733	2.92	47
	White River	Stream	478	279	13,281	2,253	34		703				16,271	.58	34
	All Areas	Stream	908	613	22,732	2,253	2,940		1,019		6		28,950	.68	32
All Workings	Longmire	Open Reproduction	477	494	50,025		2,202		5,409	5,804			63,440	1.04	133
		Stream	1,633	1,954	215,115		122,143		56,609	4,264	72		398,203	1.20	244
		All Types	2,110	2,448	265,140		124,345		62,018	10,068	72		461,643	1.16	219
	Stevens Canyon	Open Reproduction	2,351	218	28,071		15,986				7,915		51,972	.09	22
		Open Pole	704	38	176		1,052				16		1,244	.05	2
		All Upland	3,055	256	28,247		17,038				7,931		53,216	.08	17
		Stream	1,700	6,135	113,549	2,055	558,263		914	11	3,965		678,757	3.61	399
		All Types	4,755	6,391	141,796	2,055	575,301		914	11	11,896		731,973	1.34	154
	White River	Open Reproduction	132	62	7,090	239	21	1,210	550	194			9,304	.47	70
		Open Pole	3,784	3,660	210,064	83,826	2,715	146,087	17,284	10,834	91	744	471,645	.97	125
		Open Mature	644	311	28,605	14,858			5	45			43,513	.48	68
		All Upland	4,560	4,033	245,759	98,923	2,736	147,297	17,839	11,073	91	744	524,462	.88	115
		Stream	1,295	1,680	208,885	3,763	5,057	242	9,528	188	98	8	227,769	1.30	176
		All Types	5,855	5,713	454,644	102,686	7,793	147,539	27,367	11,261	189	752	752,231	.98	128
	Starbo	Open Reproduction	48	21	68	7		7		2,305			2,387	.44	50
		Open Pole	332	262	11,276	6,131		6,723	3,221	16,658			44,009	.79	133
		All Upland	380	283	11,344	6,138		6,730	3,221	18,963			46,396	.74	122
		Stream	46	46	2,663	575		476	546	409			4,669	1.00	102
		All Types	426	329	14,007	6,713		7,206	3,767	19,372			51,065	.77	120
	All Areas	Open Reproduction	3,008	795	85,254	246	18,209	1,217	5,959	8,303	7,915		127,103	.26	42
		Open Pole	4,820	3,960	221,516	89,957	3,767	152,810	20,505	27,492	107	744	516,898	.82	107
		Open Mature	644	311	28,605	14,858			5	45			43,513	.48	68
		All Upland	8,472	5,066	335,375	105,061	21,976	154,027	26,469	35,840	8,022	744	687,514	.60	81
		Stream	4,674	9,815	540,212	6,393	685,463	718	67,597	4,872	4,135	8	1,309,398	2.10	280
		All Types	13,146	14,881	875,587	111,454	707,439	154,745	94,066	40,712	12,157	752	1,996,912	1.13	152

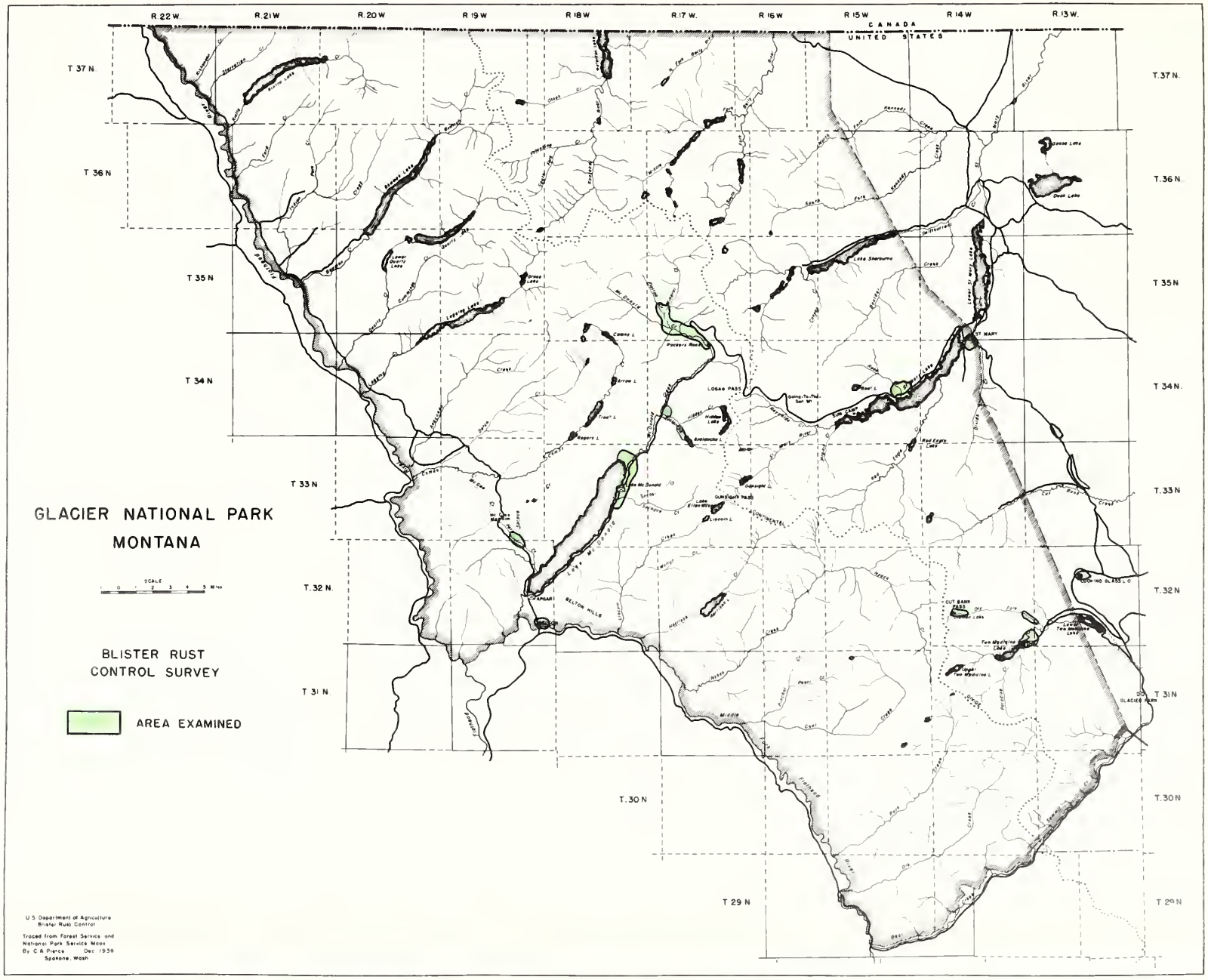

R.22W.
R.21W.
R.20W.
R.19W.
R.18W.
R.17W.
R.16W.
R.15W.
R.14W.
R.13W.
CANADA
UNITED STATES
T.37N.
T.36N.
T.35N.
T.34N.
T.33N.
T.32N.
T.31N.
T.30N.
T.29N.
GLACIER NATIONAL PARK
MONTANA
SCALE
0 1 2 3 4 5 Miles
BLISTER RUST
CONTROL SURVEY
AREA EXAMINED
U.S. Department of Agriculture
Blister Rust Control
Traced from Forest Service and
National Park Service Maps
By C.A. Pierce Dec. 1938
Spokane, Wash.

TABLE NO. 2

PINE DISEASE SURVEY, 1939
SUMMARY BY DRAINAGE AND YEARS OF RIBES ERADICATION, CLEARWATER AND ST. JOE OPERATIONS

Drainage			White Pine			Cankers		Cumulative Per Cent of Trees Infected by Years					
Years of Working	Strip Location	Miles of Strip	Number Examined	Infected Number	Infected Per Cent	Number	Per 100 Trees	Up to 1928	1929-1931	1932-1933	1934	1935-1936	1937
Clearwater Operation													
Winter Creek, T.36N R.4E													
1935	Upland	9.2	674	12	1.93	29	4.66		.32	1.29		1.77	1.93
Dan Lee Creek, T.36N R.6E													
1933	Upland	6.9	648	12	1.72	18	2.58			.29		.43	1.72
1934	Upland	4.9	435	5	1.30	5	1.30			1.04			1.30
Total	Upland	11.8	1,083	17	1.57	23	2.13			.55		.65	1.57
Quartz Creek, T.37N R.5E													
1933, 1936	Upland	30.5	12,704	317	2.50	835	6.57	.007	.04	.35		1.26	2.50
1933, 1937	Upland	1.4	118	5	4.23	5	4.23			.84			4.23
1933, 1939	Stream	1.3	1,973	361	18.30	712	36.08			.60		2.68	18.30
	Upland	8.9	6,736	224	3.32	321	4.76			.32		.37	3.32
Total	Stream	1.3	1,973	361	18.30	712	36.08			.60		2.68	18.30
	Upland	40.8	19,558	596	2.80	1,161	5.93	.005	.03	.35		.95	2.80
Trail Creek, T.37N R.5E													
1933	Upland	11.7	3,247	64	1.97	104	3.20			.24		1.29	1.97
1933, 1936	Upland	1.4	251										
1933, 1937	Upland	12.8	4,492	110	2.45	219	4.90			.18		2.34	2.45
Total	Upland	25.9	7,990	174	2.19	323	4.07			.20		1.85	2.19
Gold Creek, T.38N R.4E													
1937	Upland	2.9	998	290	29.05	996	99.80		.20	10.12	11.12	23.64	29.05
Unworked	Upland	4.3	1,515	362	23.90	1,914	126.33	.060		5.08	5.21	11.02	23.90
Total	Upland	7.1	2,513	652	25.94	2,910	115.80	.040	.12	7.08	7.56	16.03	25.94
Daniels Creek, T.38-39N R.4E													
1933	Upland	11.0	4,303	511	11.87	957	22.23			.28		1.11	11.87
1935	Upland	2.5	1,102	165	14.90	419	38.00			2.27		3.63	14.90
1936	Upland	12.5	2,011	150	7.45	305	15.20			.50		.70	7.45
Total	Upland	26.0	7,416	826	11.13	1,681	22.66			.63		1.37	11.13
Swanson Creek, T.39-40N R.7E													
1934	Upland	4.2	933	24	2.57	39	4.18			.43		.64	2.57
Unworked	Upland	6.2	3,948	705	17.86	2,321	58.79		.03	1.52		3.39	17.86
Total	Upland	10.4	4,881	729	14.94	2,360	48.35		.02	1.31		2.87	14.94
White Pine Creek, T.40N R.6E													
1933	Upland	29.1	4,111	1,374	33.42	2,760	67.14			.15		1.68	33.42
Unworked	Upland	3.1	54	8	14.81	13	24.07					1.85	14.81
Total	Upland	32.2	4,165	1,382	33.18	2,773	66.58			.14		1.68	33.18
Minnesaka Creek, T.41N R.6E													
Unworked	Upland	12.4	885	64	7.23	259	29.27			.34		1.58	7.23
Grand Total	Stream	1.3	1,973	361	18.30	712	36.08			.60		2.68	18.30
	Upland	175.8	49,165	4,402	8.95	11,519	23.43	.004	.02	.80	.83	2.20	8.95
St. Joe Operation													
Palouse River, T.42N R.1-2W													
1934	Upland	17.4	367	23	6.27	151	41.14		.27	3.54			6.27
1935	Upland	4.7	311	8	2.57	9	2.89			1.29		1.61	2.57
Total	Upland	22.1	678	31	4.57	160	23.60		.15	2.51		2.65	4.57
Sherwin-Keeler Area, T.42N R.1E													
1933	Stream	6.8	2,465	97	3.94	599	24.30			.32		.37	3.94
	Upland	3.8	1,238	53	4.28	121	9.77			.16			4.28
1934	Stream	2.2	710	10	1.41	12	1.69			.14		.70	1.41
Unworked	Stream	.9	195	27	13.85	72	36.92						13.85
Total	Stream	9.9	3,370	134	3.98	683	20.27			.27		.42	3.98
	Upland	3.9	1,238	53	4.28	121	9.77			.16			4.28
Mazie Creek, T.42N R.1E													
1934, 1938	Stream	2.4	919	271	29.49	880	95.76	.440	3.16	12.62	14.36	18.17	29.49
	Upland	10.6	6,529	960	14.70	2,860	43.80	.260	2.16	7.09	7.89	8.73	14.64
East Fork Emerald Creek, T.42N R.1E													
1934	Upland	.5	248	52	20.97	255	102.82	.910	6.85	17.38	18.55	20.16	20.97
1935	Upland	4.1	1,623	391	24.09	1,583	97.54	.620	2.65	11.93	12.45	14.66	24.09
Total	Upland	4.6	1,871	443	23.68	1,838	98.24	.640	3.20	12.56	13.25	15.39	23.68
Red Ives Area, T.42-43N R.9-9E													
Unworked	Upland	25.2	3,528	202	5.71	800	22.64			.76		1.04	5.71
Mica Creek, T.44N R.2E													
1936, 1939	Upland	.4	303	200	66.01	844	278.55	4.620	6.93	50.80		55.10	66.01
1939	Upland	.1	18	11	61.10	117	650.00			16.67		27.77	61.10
Total	Upland	.5	321	211	65.73	961	299.40	4.360	6.54	48.90		53.60	65.73
Bond Creek, T.45N R.1E													
Unworked	Upland	1.3	340	214	62.94	2,228	655.29	.290	.88	17.35		23.92	62.94
East Fork Big Creek, T.46N R.3E													
1932	Upland	5.4	1,441	234	16.24	851	59.06	.070		1.87		2.01	16.24
Unworked	Upland	3.2	1,090	147	13.49	757	69.45			2.94		3.67	13.49
Total	Upland	8.6	2,531	381	15.05	1,608	63.53	.040		2.33		2.73	15.05
Middle Fork Big Creek, T.47N R.3E													
1932	Upland	9.7	2,963	146	4.93	499	16.80			.74		.77	4.93
Unworked	Upland	11.6	2,297	67	2.92	93	4.05			.49		.57	2.92
Total	Upland	21.3	5,260	213	4.05	592	11.25			.63		.68	4.05
Grand Total	Stream	12.3	4,289	405	9.44	1,563	36.44	.090	.68	2.91	3.29	4.22	9.44
	Upland	98.1	22,296	2,708	12.15	11,168	50.09	.200	1.02	4.72	5.01	5.71	12.13

TABLE NO. 3

PINE DISEASE SURVEY, 1939
SUMMARY BY DRAINAGE AND YEARS OF RIBES ERADICATION, COEUR D'ALENE AND MOUNT SPOKANE OPERATIONS

Drainage			White Pine			Cankers		Cumulative Per Cent of Trees Infected by Years					
Years of Working	Strip Location	Miles of Strip	Number Examined	Infected Number	Infected Per Cent	Number	Per 100 Trees	Up to 1928	1929-1931	1932-1933	1934	1935-1936	1937
Coeur d'Alene Operation													
Scott and Silver Creeks, T.50N R.3E													
Unworked	Upland	2.1	1,960	1,114	56.84	12,013	612.91	*	.70	9.98		45.56	64.97
Burnt Cabin Creek, T.51N R.2W													
1924, 1927	Upland	4.7	300										
1927, 1933	Upland	7.8	1,568	2	.13	4	.26						.13
1933	Upland	14.4	1,522	9	.59	36	2.36			.26		.33	.59
1933, 1939	Upland	1.0	54										
1934	Upland	36.9	6,983	68	.97	132	1.89			.36		.47	.97
1934, 1939	Upland	7.3	1,012	33	3.26	171	16.90			.69		.89	3.26
1939	Upland	.8	7										
Unworked	Upland	2.0	183										
Total	Upland	74.8	11,629	112	.96	343	2.95			.31		.40	.96
Leiberg Creek, T.51N R.1E													
1933	Upland	1.4	374	2	.53	2	.53						.53
1934	Upland	4.2	1,381	13	.94	17	1.23			.22		.36	.94
Total	Upland	5.6	1,755	15	.85	19	1.08			.17		.28	.85
Nicholas Creek, T.51-52N R.2W													
1934	Upland	.3											
1935	Upland	7.9	1,520	1	.06	1	.06						.06
Unworked	Upland	14.7	2,790	38	1.36	51	1.83					.07	1.36
Total	Upland	22.9	4,310	39	.90	52	1.21					.05	.90
Tom Lavin Creek, T.52N R.1W													
1934	Upland	9.4	2,378	10	.42	10	.42					.04	.42
Unworked	Upland	1.2	177	1	.56	1	.56						.56
Total	Upland	10.6	2,555	11	.43	11	.43					.04	.43
Hudlow Creek T.52N R.2W													
1935	Upland	3.3	1,041	1	.08	1	.08					.08	
1936	Upland	4.4	673	36	5.35	148	22.00			1.04		1.34	5.35
1937	Upland	4.5	2,877	1	.03	1	.03					.03	
Unworked	Upland	7.4	3,320	75	2.26	203	6.11			.09		.45	2.26
Total	Upland	19.6	7,911	113	1.43	353	4.46			.13		.33	1.43
Tepee Creek, T.51-52N R.1E													
1933	Upland	2.6	541										
1934	Upland	23.0	3,249	8	.25	17	.52			.18			.25
1935	Upland	1.3	522										
1936	Upland	2.9	1,168	1	.09	1	.09						.09
1937	Upland	4.7	443										
Total	Upland	34.5	5,923	9	.15	18	.30			.10			.15
Trail Creek, T.52N R.1E													
1935	Upland	.5	295										
Unworked	Upland	8.0	4,329	4	.09	4	.09			.04			.09
Total	Upland	8.5	4,624	4	.09	4	.09			.04			.09
Callis Creek, T.52N R.1E													
1934	Upland	10.1	4,533	8	.18	8	.18			.02		.18	
Unworked	Upland	13.5	5,123	1	.02	1	.02			.02			
Total	Upland	23.6	9,656	9	.09	9	.09			.02		.09	
Independence Creek, T.53N R.1E													
Unworked	Upland	5.8	2,177	3	.14	3	.14						.14
Grand Total	Upland	207.9	52,500	1,429	2.72	12,825	24.43		.01	.25		.82	1.52
Mount Spokane Operation													
Deadman Creek, T.28N R.45E													
1935	Stream	2.8	326	8	2.45	16	4.91	.31		.61			2.45
	Upland	.3	446										
1935, 1936	Stream	.6	954	4	.42	20	2.10						.42
	Upland	.4	757	1	.13	1	.13						.13
1935, 1936 1937	Stream	.2	85	2	2.33	3	3.53			2.33			
	Upland	1.8	67	4	5.97	4	5.97						5.97
1935, 1937	Stream	6.4	1,043	101	9.68	636	60.98	.19		4.70	5.18	8.72	9.68
	Upland	6.1	907	41	4.52	109	12.02	.22	.66	3.31	3.42	4.19	4.52
1935, 1938	Stream	3.6	267	30	11.24	312	116.85		.37	.75		.30	11.24
	Upland	.5	107	3	2.80	58	54.20		1.87			2.80	
1936	Stream	2.2	533	2	.37	2	.37						.37
	Upland	.6	84	3	3.57	3	3.57						3.57
1936, 1937	Stream	4.9	380	46	12.10	184	48.42	.79		3.95	5.00	10.53	12.10
	Upland	.9	145										
1937	Stream	.8	53										
Unworked	Stream	1.4	87	5	5.75	10	11.49			1.15			5.75
Total	Stream	22.9	3,728	198	5.31	1,183	31.75	.16	.19	1.90	2.14	3.86	5.31
	Upland	10.6	2,513	52	2.07	175	6.96	.10	.32	1.39	1.43	1.79	2.07
Spirit Creek, T.28N R.45E., T.53N R.5-6W													
1936	Stream	.1	87										
1936, 1938	Stream	3.4	8,420										
1938	Stream	10.8	5,017	99	1.97	304	6.06		.02	.30		1.47	1.97
	Upland	6.0	943	44	4.66	105	11.13			.85		2.12	4.66
Unworked	Stream	11.2	7,147	170	2.38	384	5.37			.19		.81	2.38
	Upland	2.9	2,139	86	4.07	225	10.52			.14		1.78	4.07
Total	Stream	25.5	20,671	269	1.30	688	3.32		.004	.14		.63	1.30
	Upland	8.9	3,082	130	4.22	330	10.71			.36		1.88	4.22
Fish Creek, T.52N R.5W													
Unworked	Stream	3.9	715	3	.42	3	.42					.42	
Grand Total	Stream	52.3	25,114	470	1.87	1,674	6.66	.02	.03	.40	.43	1.11	1.87
	Upland	19.5	5,595	182	3.25	505	9.03	.04	.14	.82	.84	1.83	3.25

*Infection percentages based on partial data; other data included in damage studies.

TABLE NO. 4

PINE DISEASE SURVEY, 1939
SUMMARY BY DRAINAGE AND YEARS OF RIBES ERADICATION, KANIKSU OPERATION

Drainage			White Pine			Cankers		Cumulative Per Cent of Trees Infected by Years					
Years of Working	Strip Location	Miles of Strip	Number Examined	Infected Number	Infected Per Cent	Number	Per 100 Trees	Up to 1928	1929-1931	1932-1933	1934	1935-1936	1937
Tunnel Creek, T.32N R.46E., T.57N R.5-6W													
1934	Upland	14.2	7,517	101	1.34	1,005	13.37			.15		1.01	1.34
1934, 1937	Upland	8.3	5,172	231	4.47	495	9.57		.02	.91	.99	3.05	4.47
Total	Upland	22.5	12,689	332	2.62	1,500	11.82		.01	.46	.49	1.84	2.62
Lamb Creek, Upper West Branch, T.35N R.45E													
1934	Upland	3.1	10,195	574	5.63	730	7.16					.74	5.63
1934, 1938	Upland	3.5	769	10	1.34	13	1.69					.26	1.34
1938	Upland	4.5	1,989	32	1.61	53	2.66					.10	1.61
Total	Upland	11.2	12,953	616	4.76	796	6.15					.61	4.75
Kalispell Rock Area, T.36N R.45E													
1934	Upland	3.4	7,800	12	.17	12	.17					.09	.17
1938	Upland	4.1	1,735	18	1.04	24	1.38			.06		.46	1.04
Total	Upland	7.5	9,535	30	.34	36	.41			.01		.16	.34
South Fork Granite Creek, T.37N R.45E													
1934	Upland	2.7	1,997	2	.10	2	.10					.05	.10
Unworked	Upland	12.2	8,602	1,464	17.02	3,317	38.56			.26		7.09	17.02
Total	Upland	14.9	10,599	1,466	13.83	3,319	31.31			.21		5.76	13.85
Cache Creek, T.37N R.45E													
1934	Upland	5.9	7,187	19	.26	20	.28					.03	.26
1934, 1939	Upland	3.9	4,540										
Unworked	Upland	4.0	6,257	1,113	17.79	3,250	51.94			.24	.34	8.10	17.79
Total	Upland	13.8	17,984	1,132	6.29	3,270	18.18			.08	.12	2.83	6.29
Tillicum Creek, T.37N R.45E													
1934	Upland	14.2	24,089	108	.44	187	.77			.045		.19	.44
1934, 1936	Upland	1.1	755										
Unworked	Upland	21.6	35,618	873	2.45	1,516	4.25					.38	2.45
Total	Upland	36.9	60,462	981	1.62	1,703	2.81			.01		.30	1.62
Big Creek, T.57-58N R.3-4W													
1928	Stream	3.9	1,982	252	12.71	984	49.64			.05		1.16	12.71
	Upland	16.1	3,611	532	14.73	1,200	33.25			.49		3.43	14.73
1928, 1937	Upland	7.4	4,871	100	2.05	201	4.12	.02		.08		.65	2.05
1934	Upland	3.4	175	1	.57	1	.57						.57
1934, 1937	Upland	1.8	166	2	1.20	3	1.80					1.20	
1939	Upland	1.3	25										
Unworked	Stream	5.7	1,126	4	.35	5	.44					.35	
	Upland	17.1	2,432	28	1.15	62	2.55		.16	.32	.86		1.15
Total	Stream	9.6	3,108	256	8.23	989	31.82			.03		.87	8.23
	Upland	47.1	11,280	663	5.88	1,467	13.01	.008	.04	.26	.38	1.59	5.88
Quartz Creek, T.57-58N R.5W													
1934	Upland	27.2	2,538	8	.32	25	.99		.04	.12			.32
1938	Upland	3.2	402										
Unworked	Upland	1.9	708	4	.56	4	.56					.28	.56
Total	Upland	32.3	3,648	12	.34	29	.79		.03	.08		.14	.34
Hunt Creek, T.60-61N R.3W													
1934	Upland	.6	457										
1934, 1939	Stream	.3	314	12	3.82	58	18.47			.96		3.18	3.82
	Upland	6.6	8,057	73	.91	124	1.54	.01		.51	.53	.67	.91
1939	Upland	2.3	834	4	.48	4	.48	.12		.24			.48
Unworked	Upland	1.0	90										
Total	Stream	.3	314	12	3.82	58	18.47			.96		3.18	3.82
	Upland	10.6	9,438	77	.82	128	1.36	.02		.45	.47	.59	.82
Hughes Fork, T.39-40N R.45E., T.64N R.5W													
1936	Stream	1.7	251	1	.40	1	.40					.40	
	Upland	6.8	2,342	16	.68	22	.94			.04		.56	.68
Unworked	Stream	12.1	1,227	19	1.55	34	2.77			.57		1.47	1.55
	Upland	50.1	15,815	565	3.57	5,064	32.02	.13	.25	.96	1.13	2.57	3.57
Total	Stream	13.8	1,478										
	Upland	56.9	18,157	581	3.20	5,086	28.01	.11	.22	.84	.99	2.31	3.20
Upper Priest River, T.64-65N R.5W													
1924	Stream	3.9	233										
	Upland	12.2	1,356	23	1.70	143	10.54		.37			.88	1.70
1925	Stream	5.2	345										
	Upland	11.2	2,755	223	8.09	1,266	45.95			.25		4.25	8.09
1925, 1936	Upland	.9	146										
Unworked	Stream	6.5	63										
	Upland	20.4	3,257	82	2.52	829	25.45		.03	.31		1.23	2.52
Total	Stream	15.6	641										
	Upland	44.7	7,514	328	4.36	2,238	29.78		.01	.29		2.25	4.36
Grand Total	Stream	39.3	5,541	288	5.20	1,082	19.53			.20		1.01	5.20
	Upland	298.5	174,259	6,218	3.56	19,572	11.23	.01	.03	.20	.24	1.41	3.56

TABLE NO. 1

RESULTS OF COMPARATIVE STUDIES SHOWING ACTUAL DATA FOR EACH OPERATION CONDUCTED BY THE TAGGING AND REGULAR ERADICATION METHODS TESTS
MOUNT SPOKANE OPERATION

Regular Eradication Method								Tagging Method															
Plot No. and Division		First Working		Mop-Up		20 Per Cent Check		Plot No. and Division		First Working					Mop-Up			20 Per Cent Check					
										Time Per Operation			No. Ribes Pulled				No. Ribes Pulled	No. Ribes and Feet Live Stem Found					
																		Tagged		Untagged		Total	
Plot No.	Subplot No.*	Pulling Time Hrs. Min.	Total No. Ribes Pulled	Pulling Time Hrs. Min.	Total No. Ribes Pulled	Total No. Ribes	Total F.L.S.	Plot No.	Subplot No.*	Tagging Time Hrs. Min.	Pulling Time Hrs. Min.	Total Time Hrs. Min.	Tagged	Untagged	Total	Pulling Time Hrs. Min.	Tagged	Untagged	Total	No. Ribes	F.L.S.	No. Ribes	F.L.S.	No. Ribes	F.L.S.
1	A	30 : 15	2,733	2 : 20	90	1	.4	9	A	3 : 15	14 : 45	18 : 00	1,931	232	2,163	1 : 50	33	126	159	3	8.0	5	1.6	8	9.6
	B	29 : 45	2,811	2 : 00	39	5	14.4		B	4 : 15	17 : 15	21 : 30	2,147	182	2,329	2 : 50	50	264	188			10	3.7	10	3.7
	C	23 : 00	2,150	2 : 00	121	4	5.8		C	3 : 00	14 : 45	17 : 45	1,226	133	1,668	3 : 30	30	127	157	1	2.0	16	17.4	17	19.4
	D	27 : 00	2,522	2 : 00	37	2	15.4		D	3 : 00	19 : 15	22 : 15	1,932	453	2,385	1 : 50	19	146	165			10	5.5	10	5.5
	E	25 : 00	2,153	2 : 10	74	4	1.7		E	1 : 30	4 : 15	5 : 45	262	48	310	1 : 40	11	56	67			6	2.5	6	2.5
2	A	20 : 30	1,901	1 : 40	36	4	1.2	10	A	2 : 45	18 : 15	21 : 00	2,692	143	2,835	2 : 40	29	108	137			7	2.7	7	2.7
	B	15 : 30	1,293	1 : 40	32	2	1.2		B	4 : 15	19 : 00	23 : 15	2,497	57	2,554	2 : 40	85	264	349			4	3.4	4	3.4
	C	20 : 30	1,656	1 : 40	61	2	2.6		C	2 : 30	7 : 15	9 : 45	605	36	641	1 : 40	11	100	111			2	3.2	2	3.2
	D	21 : 00	1,657	1 : 20	27	1	1.0		D	2 : 30	9 : 00	11 : 30	1,265	63	1,328	1 : 50	18	147	165	1	.6	12	6.5	13	7.1
	E	15 : 30	1,383	2 : 00	76	3	.9		E	2 : 45	8 : 00	10 : 45	697	45	742	2 : 00	46	236	282	1	1.0	4	2.5	5	3.5
3	A	52 : 30	3,898	2 : 00	90	9	5.7	11	A	2 : 00	26 : 15	28 : 15	4,003	307	4,310	4 : 50	102	409	511	2	.7	15	9.4	17	10.1
	B	41 : 30	4,330	2 : 20	144	10	11.7		B	3 : 45	15 : 15	19 : 00	2,465	173	2,638	2 : 40	63	256	319			3	4.3	3	4.3
	C	24 : 00	2,160	1 : 50	144	7	15.8		C	5 : 30	14 : 30	20 : 00	1,668	121	1,789	2 : 10	24	156	180			11	8.4	11	8.4
	D	18 : 45	1,609	3 : 00	337	4	1.8		D	5 : 30	16 : 50	22 : 20	1,894	39	1,933	2 : 00	30	229	259	2	2.8	9	20.7	11	23.5
	E	33 : 15	4,180	2 : 30	225	13	13.4		E	7 : 30	15 : 20	22 : 50	1,912	37	1,949	3 : 20	17	196	213	2	7.0	15	18.4	17	25.4
4	A	8 : 45	785	1 : 40	81			12	A	5 : 00	9 : 30	14 : 30	863	146	1,009	1 : 30	21	76	97	1	4.5	3	7.8	4	12.3
	B	7 : 15	784	1 : 30	92	10	6.9		B	3 : 00	18 : 15	21 : 15	1,638	103	1,741	3 : 00	51	203	254			9	8.5	9	8.5
	C	12 : 00	947	1 : 40	97	3	3.7		C	2 : 45	24 : 45	27 : 30	2,219	115	2,334	4 : 20	69	364	433	2	11.0	7	10.6	9	21.6
	D	11 : 15	975	2 : 00	99	2	2.7		D	3 : 45	37 : 15	41 : 00	3,927	96	4,023	4 : 00	41	275	316	5	21.0	19	34.0	24	55.0
	E	9 : 30	739	1 : 40	44	8	5.7		E	4 : 00	43 : 40	47 : 40	4,356	94	4,450	3 : 20	50	268	318	6	26.3	11	20.7	17	47.0
5	A	10 : 30	737	1 : 20	47	2	1.8	13	A	4 : 15	22 : 00	26 : 15	1,498	115	1,613	2 : 50	28	209	237			6	24.2	6	24.2
	B	16 : 30	1,324	3 : 10	116	2	2.5		B	4 : 30	21 : 00	25 : 30	1,472	213	1,685	2 : 00	16	126	142	1	5.0	7	9.9	8	14.9
	C	11 : 00	1,002	1 : 30	82	1	2.0		C	4 : 00	25 : 00	29 : 00	2,387	163	2,550	3 : 00	24	108	132	1	3.0	10	9.3	11	12.3
	D	11 : 30	774	1 : 40	63	2	1.4		D	3 : 15	13 : 00	16 : 15	1,303	91	1,394	2 : 40	25	130	155			7	7.8	7	7.8
	E	15 : 45	1,618	2 : 50	170	3	4.7		E	3 : 15	16 : 00	19 : 15	1,379	108	1,487	3 : 20	19	153	172			8	5.6	8	5.6
6	A	4 : 00	218	1 : 20	18			14	A	2 : 00	12 : 45	14 : 45	1,098	59	1,157	2 : 00	29	104	133			3	5.0	3	5.0
	B	5 : 00	301	1 : 40	44				B	1 : 15	6 : 00	7 : 15	574	29	603	2 : 00	7	75	82			2	.5	2	.5
	C	4 : 45	252	1 : 20	24	2	.8		C	1 : 30	6 : 00	7 : 30	596	52	648	1 : 00	8	33	41			2	2.5	2	2.5
	D	6 : 45	485	1 : 30	83	5	9.9		D	1 : 45	4 : 00	5 : 45	479	21	500	1 : 00	6	22	28			7	3.6	7	3.6
	E	7 : 45	526	1 : 30	82	1	.3		E	2 : 15	6 : 00	8 : 15	794	113	907	2 : 00	14	74	88			2	1.3	2	1.3
7	A	17 : 15	1,194	2 : 00	185	5	11.6	15	A	3 : 30	40 : 20	43 : 50	2,744	225	2,969	3 : 10	33	299	332	1	1.0	6	7.3	7	8.3
	B	17 : 30	1,130	2 : 00	105	3	1.7		B	4 : 15	49 : 00	53 : 15	3,725	345	4,070	4 : 00	21	345	366			8	28.4	8	28.4
	C	18 : 30	1,052	3 : 10	246	7	11.5		C	4 : 00	48 : 40	52 : 40	3,928	587	4,515	4 : 00	23	325	348	1	1.0	14	21.5	15	22.5
	D	14 : 30	894	1 : 50	128	4	15.0		D	4 : 00	27 : 00	31 : 00	1,906	229	2,135	2 : 40	18	208	226	1	6.0	1	.2	2	6.2
	E	12 : 30	1,037	3 : 40	204	2	6.9		E	4 : 15	40 : 30	44 : 45	3,209	324	3,533	3 : 00	23	171	194	1	1.0	4	2.8	5	3.8
8	A	30 : 30	2,432	2 : 00	173	3	7.2	16	A	4 : 45	63 : 50	68 : 35	8,116	1,387	9,503	3 : 30	81	361	442	2	16.0	3	26.0	5	41.0
	B	27 : 25	2,522	3 : 50	118	10	6.2		B	4 : 45	48 : 00	52 : 45	3,607	613	4,220	4 : 40	41	480	521	2	13.5	19	38.5	21	52.0
	C	13 : 50	1,164	3 : 50	172	4	8.4		C	6 : 15	66 : 00	72 : 15	5,658	712	6,370	7 : 20	54	612	666	1	20.0	26	68.3	27	88.3
	D	24 : 00	1,736	4 : 00	267	6	43.0		D	5 : 00	45 : 45	50 : 45	3,235	527	3,762	5 : 20	41	431	472	2	4.8	7	14.8	9	19.6
	E	43 : 00	3,928	4 : 30	397	4	14.6		E	3 : 45	56 : 55	60 : 40	4,883	941	5,824	5 : 20	42	546	588	3	12.5	16	36.3	19	48.8

* Each subplot represents one-half acre.



TABLE NO. 3

RESULTS OF COMPARATIVE STUDIES SHOWING ACTUAL DATA FOR EACH OPERATION CONDUCTED BY THE TAGGING AND REGULAR ERADICATION METHODS TESTS
KANIKSU OPERATION

Regular Eradication Method								Tagging Method																	
Plot No. and Division		First Working		Mop-Up		20 Per Cent Check		Plot No. and Division		First Working						Mop-Up			20 Per Cent Check					
										Time Per Operation			No. Ribes Pulled						No. Ribes and Feet Live Stem Found					
																			Tagged		Untagged		Total	
Plot No.	Subplot No.*	Pulling Time Hrs. Min.	Total No. Ribes Pulled	Pulling Time Hrs. Min.	Total No. Ribes Pulled	Total No. Ribes	Total F.L.S.	Plot No.	Subplot No.*	Tagging Time Hrs. Min.	Pulling Time Hrs. Min.	Total Time Hrs. Min.	While Tagging	Tagged	Untagged	Total	Pulling Time Hrs. Min.	Tagged	Untagged	Total	No. Ribes	F.L.S.	No. Ribes	F.L.S.	No. Ribes	F.L.S.
	A	2 : 00	145	: 40	15				A	2 : 30	6 : 00	8 : 30	27	827	41	895	1 : 20	25	55	80	3	5.0	3	2.3	6	7.3
	B	2 : 45	344	1 : 00	38	2	2.7		B	2 : 00	3 : 00	5 : 00	13	221	34	268	: 40	12	49	61	9	28.9	7	12.4	16	41.3
1	C	4 : 15	438	: 40	22	3	6.0	9	C	1 : 00	1 : 30	2 : 30	14	99	13	126	: 40	8	47	55	1	1.1	2	1.7	3	2.8
	D	4 : 45	555	: 40	25	2	4.3		D	1 : 00	1 : 00	2 : 00	8	33	2	43	: 40	6	14	20			1	1.6	1	1.6
	E	2 : 00	301	: 40	18	1	6.5		E	1 : 00	1 : 00	2 : 00	10	96	12	118	: 40	4	15	19						
	A	1 : 45	77	: 40	6	3	23.8		A	: 30	1 : 30	2 : 00	11	80	13	104	: 20	3	8	11			2	1.3	2	1.3
	B	2 : 15	87	: 40	29	8	31.9		B	: 30	: 30	1 : 00	2	19	2	23	: 20		3	3						
2	C	2 : 15	130	: 40	20	5	38.0	10	C	: 30	1 : 00	1 : 30	7	40	5	52	: 20		21	21			1	2.5	1	2.5
	D	3 : 00	271	: 40	26	5	33.8		D	: 30	1 : 00	1 : 30	2	74	3	79	: 20	2	1	3						
	E	4 : 45	372	: 40	25	6	31.0		E	: 30	1 : 30	2 : 00	2	97	9	108	: 20	2	9	11						
	A	1 : 15	87	: 40	18				A	: 30	2 : 00	2 : 30	1	100	8	109	: 20	2		2			1	21.0	1	21.0
	B	2 : 45	317	: 40	34	1	1.0		B	: 30	1 : 30	2 : 00	1	54	4	59	: 20	3	4	7	2	31.5	1	3.5	3	35.0
3	C	4 : 00	310	: 40	19	1	.3	11	C	: 30	1 : 30	2 : 00		82	15	97	: 40	4	36	40	1	2.0	2	10.5	3	12.5
	D	4 : 45	532	: 40	21	4	13.8		D	: 30	: 30	1 : 00	1	15	5	21	: 20	2	8	10						
	E	1 : 00	77	: 20	7				E	: 30	1 : 30	2 : 00		38	2	40	: 20	3	1	4	1	1.5	2	18.5	3	20.0
	A	2 : 45	143	: 40	18				A	: 30	1 : 00	1 : 30	3	54	6	63	: 20	3	1	4						
	B	3 : 00	247	: 40	26				B	: 30	1 : 00	1 : 30	1	55	4	60	: 40	1	7	8			1	6.5	1	6.5
4	C	3 : 30	462	: 40	22	8	14.5	12	C	: 30	1 : 30	2 : 00	2	30	5	37	: 20	10	12	22						
	D	4 : 15	818	: 50	37	4	13.1		D	: 30	1 : 30	2 : 00	1	90	14	105	: 40	3	24	27						
	E	3 : 00	439	: 40	14	1	1.5		E	: 30	2 : 00	2 : 30	1	113	8	122	: 40	6	9	15	2	6.2	2	1.5	4	7.7
	A	2 : 15	316	: 40	16	5	9.6		A	1 : 00	2 : 30	3 : 30	12	385	8	405	: 40	2	31	33			1	2.0	1	2.0
	B	3 : 00	495	: 40	27	10	40.7		B	1 : 00	2 : 30	3 : 30	10	203	9	222	: 20		10	10						
5	C	5 : 15	592	: 40	34	4	6.6	13	C	1 : 00	3 : 30	4 : 30	9	348	21	378	1 : 00	10	33	43						
	D	6 : 15	839	: 40	27	9	21.5		D	1 : 00	4 : 15	5 : 15	8	524	36	568	: 40	9	63	72	3	34.0	6	60.0	9	94.0
	E	4 : 30	509	: 40	79	3	.5		E	1 : 30	3 : 45	5 : 15	6	635	27	668	1 : 00	20	45	65			3	26.5	3	26.5
	A	2 : 25	284	: 40	36	1	2.0		A	: 30	1 : 30	2 : 00	14	108	12	134	: 20	3	9	12			1	.5	1	.5
	B	4 : 30	992	: 40	18	10	30.7		B	: 30	1 : 45	2 : 15	14	127	10	151	: 20	1	12	13	1	2.2	1	4.0	2	6.2
6	C	3 : 45	446	: 40	28	2	2.5	14	C	1 : 00	2 : 00	3 : 00	11	169	7	187	: 40	2	21	23			1	2.2	1	2.2
	D	3 : 30	405	: 40	42	6	20.8		D	1 : 00	2 : 00	3 : 00	12	134	14	160	: 40	12	16	28	1	2.0	3	20.2	4	22.2
	E	4 : 05	924	: 40	72	10	68.0		E	: 30	3 : 00	3 : 30	8	323	13	344	: 20	10	22	32			2	3.7	2	3.7
	A	1 : 50	215	: 40	22	3	14.4		A	1 : 30	3 : 00	4 : 30	25	355	21	401	: 40	13	18	31			3	9.3	3	9.3
	B	5 : 15	622	: 40	21	9	49.5		B	1 : 30	2 : 00	3 : 30	74	177	17	268	: 20		17	17			4	10.7	4	10.7
7	C	3 : 30	343	: 50	35	6	19.5	15	C	1 : 00	2 : 45	3 : 45	42	429	22	493	: 40	57	8	65			6	4.8	6	4.8
	D	3 : 00	294	: 50	37	6	32.0		D	1 : 00	1 : 45	2 : 45	34	114	8	156	: 40	3	24	27	2	4.3	2	1.5	4	5.8
	E	5 : 00	517	1 : 00	77	6	46.6		E	: 30	2 : 15	2 : 45	18	217	55	290	: 40	4	20	24			2	2.2	2	2.2
	A	7 : 00	831	1 : 00	45	8	65.9		A	1 : 00	2 : 00	3 : 00	13	188	16	217	: 40	5	18	23			5	7.5	5	7.5
	B	4 : 00	488	1 : 00	38	9	30.7		B	1 : 00	1 : 15	2 : 15	46	208	7	261	: 40	1	17	18			3	6.0	3	6.0
8	C	5 : 30	765	1 : 10	51	17	115.6	16	C	1 : 00	1 : 45	2 : 45	23	381	8	412	: 20	6	29	35			4	20.5	4	20.5
	D	4 : 30	539	1 : 10	42	8	37.0		D	1 : 00	1 : 30	2 : 30	30	144	15	189	: 20	1	25	26			1	.7	1	.7
	E	8 : 00	842	1 : 20	105	6	57.0		E	: 30	1 : 00	1 : 30	15	136	8	159	: 20	1	11	12			15	11.0	15	11.0

* Each subplot represents one-half acre.



W 2640. Mount Spokone operotion. Ecology Plot No. 2. Portiol cutting, 1935 with no slosh disposol, showing heovy R. viscosissimum regeneration. Togged stokes mark white pine seedlings



W 2640-2. Mount Spokone operotion. Ecology Plot No. 2. Follow-up of W 2640 showing the oreo ofter crews removed the R. viscosissimum The duff ond humus hove been disturbed exposing minerol soil. Ropid growth of white pine seedlings is typicol os seen against white background.



W 2637. Swamp Creek Slash Disposal Area No. 1, St Joe National Forest. On this area the logging slash was piled and burned along a main right of way (right center). Away from road (left center) slash was only lopped and scattered. The heavy residual stand is almost pure cedar pole stock.



W 2628. Swamp Creek Slash Disposal Area No. 1, St Joe National Forest. Near average conditions of lopping and scattering logging slash. Suspended slash will cause hazardous fire conditions for many years but slash on ground will rapidly decompose. Residual cedar pole stand maintains a high degree of the full forest cover.

Exhibit I

APPROPRIATIONS AND ALLOTMENTS
(Bureau of Entomology and Plant Quarantine)

During the calendar year 1938, the [illegible] allotments of $18 000.00. With this exception all other funds used [illegible] were allocated by the Federal Government.

During the calendar year 1939 funds were [illegible] Western Division of Plant Disease Control by allowances from the appropriations for blister rust control for the fiscal years [illegible] by allotments from Work Projects Administration funds for the [illegible] 1939 and 1940 as follows:

TABLE NO. 1

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
CALENDAR YEAR 1939, REGULAR APPROPRIATIONS

Project	January 1 to June 30, 1939			July 1 to December 31, 1939			Grand Total
	Salaries	Expense	Total	Salaries	Expense	Total	
3.2 Cooperative Ribes Eradication on Federal Lands							
3.21-2 - Cabinet National Forest, Montana	$ 855.00	$ 67.24	$ 922.24	$ 1,215.00	$112.46	$ 1,327.46	$ 2,249.70
3.21-3 - Kootenai National Forest, Montana	495.00	7.47	502.47	135.00	12.50	147.50	649.97
3.22 - Method Studies of Ribes Eradication				649.98		649.98	649.98
3.3 Cooperative Ribes Eradication on National Parks							
3.31 - Glacier National Park, Montana	450.44	280.86	731.30	884.70	155.86	1,040.56	1,771.86
3.33-1 - Mt. Rainier National Park, Washington		189.26	189.26	412.50		412.50	601.76
3.4 Cooperative Ribes Eradication on State and Private Lands							
3.42-1 - Clearwater Operation, Idaho	3,745.61	1,850.73	5,596.34	2,194.97	9.12	2,204.09	7,800.43
3.42-2 - St. Joe Operation, Idaho	3,949.65	2,335.00	6,284.65	3,140.97	10.34	3,151.31	9,435.96
3.42-3 - Coeur d'Alene Operation, Idaho	1,350.00		1,350.00	675.00		675.00	2,025.00
3.42-4 - Kaniksu Operation, Idaho	3,461.98	1,085.43	4,547.41	2,805.00	6.08	2,811.08	7,358.49
3.42-5 - Mt. Spokane Operation, Idaho	1,325.96	235.45	1,561.41	492.31	4.86	497.17	2,058.58
3.43-2 - Mt. Spokane Operation, Washington	1,066.64	189.26	1,255.90				1,255.90
3.47 - Pike Operation, Colorado	866.64		866.64				866.64
4.1 Field Studies, Spread of the Rust							
4.12 - Idaho	2,150.00		2,150.00	1,650.00		1,650.00	3,800.00
4.13 - Washington		61.50	61.50	25.20	10.00	35.20	96.70
6. Educational Work	1,299.96	417.16	1,717.12	1,299.96	8.73	1,308.69	3,025.81
9. Maintenance of Field Office and Miscellaneous Expenses							
9.1 - Supervision	2,333.28	40.65	2,373.93	2,400.00	214.25	2,614.25	4,988.18
9.2 - Office Maintenance	6,800.88	1,275.00	8,075.88	4,253.38		4,253.38	12,329.26
Grand Total	$30,151.04	$8,035.01	$38,186.05	$22,233.97	$544.20	$22,778.17	$60,964.22

TABLE NO. 2

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
JANUARY 1-JUNE 30, 1939
701082-658/9999-EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT QUARANTINE, PUBLIC BUILDINGS, PARKS, UTILITIES, FLOOD CONTROL, ETC. (TRANSFER FROM W.P.A.) 1938-1939

Project	Salaries	Expense	Total
701-2-281, Idaho			
8.12 Field Studies, Pine Disease Survey	$ 2,171.32	$ 159.77	$ 2,331.09
8.22 Method Studies of Ribes Eradication		36.71	36.71
8.42-1 Cooperative Ribes Eradication, Clearwater Operation	22,102.17	11,370.58	33,472.75
8.42-2 Cooperative Ribes Eradication, St. Joe Operation	29,132.46	13,902.68	43,035.14
8.42-3 Cooperative Ribes Eradication, Coeur d'Alene Operation	276.00	98.20	374.20
8.42-4 Cooperative Ribes Eradication, Kaniksu Operation	16,029.56	8,039.74	24,069.30
8.42-5 Cooperative Ribes Eradication, Mt. Spokane Operation	10,979.02	3,053.30	14,032.32
8.9-1 Supervision		47.93	47.93
8.9-2 Spokane Office Maintenance	150.00	236.99	386.99
8.9-3 Miscellaneous Supplies and Services		22.56	22.56
Total 701-2-281, Idaho	80,840.53	36,968.46	117,808.99
701-2-100, Washington			
8.13 Field Studies, Pine Disease Survey	2,501.04		2,501.04
8.33-1 Cooperative Ribes Eradication, Mt. Rainier National Park		47.24	47.24
8.43-1 Cooperative Ribes Eradication, Kaniksu Operation	92.95		92.95
8.43-2 Cooperative Ribes Eradication, Mt. Spokane Operation	7,327.84	3,901.82	11,229.66
8.6 Educational Work	1,299.88	423.79	1,723.67
8.9-1 Supervision		37.83	37.83
8.9-2 Spokane Office Maintenance	6,435.93	81.70	6,517.63
8.9-3 Miscellaneous Supplies and Services		557.79	557.79
8.9-4 Miscellaneous Purchases in Washington, D. C.		2,006.44	2,006.44
Total 701-2-100, Washington	17,657.64	7,056.61	24,714.25
701-2-279, Colorado			
8.47 Cooperative Ribes Eradication, Pike Operation	403.20	71.79	474.99
Total 701-2-279, Colorado	403.20	71.79	474.99
Grand Total January 1-June 30, 1939	$98,901.37	$44,096.86	$142,998.23

701009-658/9999-EMERGENCY RELIEF, AGRICULTURE, ADMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1938-1939

701-9-2 (Washington) Project 2027			
8.6 Educational Work		78.56	78.56
8.9-1 Supervision		33.85	33.85
8.9-2 Spokane Office Maintenance	2,568.85	1,059.65	3,628.50
8.9-3 Miscellaneous Supplies and Services		207.24	207.24
Total Administrative, 701009	$ 2,568.85	$ 1,379.30	$ 3,948.15

TABLE NO. 3

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
JULY 1-DECEMBER 31, 1939
201087-650999 EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT QUARANTINE,
FEDERAL NON-CONSTRUCTION PROJECTS (TRANSFER FROM W.P.A.) 1940

Project	Salaries	Expense	Total
01-2-92-91, Idaho			
8.12 Field Studies, Pine Disease Survey	$ 2,858.15	$ 734.68	$ 3,592.83
8.22 Method Studies of Ribes Eradication	991.65	578.09	1,569.74
8.42-1 Cooperative Ribes Eradication, Clearwater Operation	44,055.95	10,532.27	54,588.22
8.42-2 Cooperative Ribes Eradication, St. Joe Operation	45,931.63	12,592.53	58,524.16
8.42-3 Cooperative Ribes Eradication, Coeur d'Alene Operation	675.00	159.01	834.01
8.42-4 Cooperative Ribes Eradication, Kaniksu Operation	34,791.62	8,547.73	43,339.35*
8.42-5 Cooperative Ribes Eradication, Mt. Spokane Operation	20,097.93	3,241.84	23,339.77
8.6 Educational Work		222.73	222.73
8.9-1 Supervision		188.92	188.92
8.9-2 Spokane Office Maintenance	2,632.50	2,083.71	4,716.21
8.9-3 Miscellaneous Supplies and Services		543.27	543.27
Total 01-2-92-91, Idaho	152,034.43	39,424.78	191,459.21
01-2-93-102, Washington			
8.13 Field Studies, Pine Disease Survey	1,184.96	14.60	1,199.56
8.23 Method Studies of Ribes Eradication		5.18	5.18
8.33-1 Cooperative Ribes Eradication, Mt. Rainier National Park		103.61	103.61
8.43-2 Cooperative Ribes Eradication, Mt. Spokane Operation	8,999.16	1,160.83	10,159.99
8.6 Educational Work	948.49	252.45	1,200.94
8.9-1 Supervision		7.10	7.10
8.9-2 Spokane Office Maintenance	3,517.23	273.73	3,790.96
8.9-3 Miscellaneous Supplies and Services	1,069.35	604.92	1,674.27
Total 01-2-93-102, Washington	15,719.19	2,422.42	18,141.61
Grand Total July 1-December 31, 1939	$167,753.62	$41,847.20	$209,600.82

201088-650999 EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT QUARANTINE,
ADMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1940

01-9-08-1 (Washington)			
8.9-2 Spokane Office Maintenance	3,170.03	111.75	3,281.78
Total Administrative, 201088	$ 3,170.03	$ 111.75	$ 3,281.78

* Does not include approximately $228.70 for October, November, and December field invoices not yet paid.

Year	State	Delvalle	[illegible]
1928	$ 2 516 05	$ 3 [illegible]	$ [illegible]
1929		[illegible]	[illegible]
1930		[illegible]	[illegible]
1931	5 [illegible]	[illegible]	[illegible]
1932	9 003 43	[illegible]	[illegible]
1933			
1934	99 151 06		[illegible]
1935	15 000 00		[illegible]
1936	10 990 25		[illegible]
1937	15 001 25		[illegible]
1938	15 000,14		[illegible]
1939	15 438 04		[illegible]
[illegible]	$ 23 124 02	[illegible]	[illegible]

TABLE NO 6

SUMMARY OF FEDERAL EXPENDITURES BY ACTIVITIES, NORTHWESTERN REGION
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
1939

State	Appropriation	Total	Activity					
			Ribes Eradication	Methods Development	Preeradication	Disease Survey	Education and Information	Office and Miscellaneous
Idaho	Regular	$ 47 099 73	$ 29 032 86	$ 242 49		$ 5 500.00	$ 11 026 [illegible]	$ 3 366 40
	ERA	315,038 13	295 840 06	1 606 45		3 923 92	222 [illegible]	11 [illegible]
	Total	362 137 86	324 870 92	1 838 94		9 423 92	1 221 34	20 [illegible]
Montana	Regular	8 857 54	2 235 14	292 49	1,392.00		1,736 69	2 [illegible]
Washington	Regular	4 140 34	1 847 56	65 00		96 70	200 81	1 [illegible]
	ERA	44 315.86	21 594 35	5 18	84 00	3 000 60	2 924 54	[illegible]
	Total	48 456 20	23 441.04	70 18	84 00	3 097,30	3 205 42	[illegible]
Subtotal Western White Pine Region	Regular	60 097.58	33 815 35	649 98	1 392 00	3 [illegible]	3 [illegible]	1 [illegible]
	ERA	359 353 59	317 440 [illegible]	1 611 63	84 00	9 [illegible]	3,147 54	[illegible]
	Total	419 451 17	351 [illegible]	2 261 61	1 476 00	12 [illegible]	[illegible]	[illegible]
Colorado	Regular	866 64					866 64	
	ERA	474 99					474 99	
	Total	1 341 63					1 341 63	
Total Northwestern Region	Regular	60 964 32	34 [illegible]	649 98	1,392.00	3 [illegible]	5 [illegible]	[illegible]
	ERA	359 838 58	317 440 [illegible]	1,611 63	84 00	9 [illegible]	[illegible]	[illegible]
	Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE NO. 6

SUMMARY OF FEDERAL EXPENDITURES, NORTHWESTERN REGION OF BLISTER RUST CONTROL
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
1922 - 1939

State	Appropriation	Total	Ribes Eradication	Methods Development	Chemical Investigation	Reconnaissance and Preeradication	Ecology	Disease Survey and Scouting	Damage Studies	Education and Information	Quarantine Enforcement	Cultivated Black Currant Eradication	Nursery Sanitation	Office and Miscellaneous	Supervision
Idaho	Regular	$1,111,382.26	$ 587,224.35	$ 92,669.94	$ 64,575.98	$54,033.32	$45,103.42	$23,729.38	$25,679.88	$32,015.10	$10,758.86	$ 28,173.15		$113,750.53	$33,668.35
	NIRA	470,841.62	423,058.33	4,662.40	3,441.74		3,293.09			6,366.50				28,083.64	1,935.92
	ERA	2,666,040.54	2,572,621.96	1,957.56	937.99			31,694.52		3,094.82	1,456.86			52,857.64	1,519.19
	Total	4,248,264.42	3,582,804.64	99,289.90	68,955.71	54,033.32	48,396.51	55,423.90	25,679.88	41,476.42	12,215.72	28,173.15		194,691.81	37,123.46
Montana	Regular	185,713.70	25,167.30	11,949.39	15,809.93	12,400.17	2,533.00	13,928.33	7,517.94	9,763.40	9,781.81	22,010.30	$15,160.41	29,338.42	10,353.30
	NIRA	88,306.79	80,458.56		258.00	902.74				2,689.14			148.36	3,287.99	562.00
	ERA	196,847.11	193,848.78					219.31		32.72				2,730.30	16.00
	Total	470,867.60	299,474.64	11,949.39	16,067.93	13,302.91	2,533.00	14,147.64	7,517.94	12,485.26	9,781.81	22,010.30	15,308.77	35,356.71	10,931.30
Washington	Regular	202,984.75	15,972.82	815.00	12,837.91	4,770.40	2,425.10	20,988.19	8,150.83	6,523.13	18,957.24	63,838.81	2,273.74	30,154.05	15,277.53
	NIRA	105,199.60	92,044.82		274.01					3,170.46				9,148.31	562.00
	ERA	404,706.30	253,837.40	78.06	41.74	307.37		5,259.56		11,968.12				133,076.90	148.15
	Total	712,890.65	361,855.04	893.06	13,153.66	5,077.77	2,425.10	26,247.75	8,150.83	21,661.71	18,957.24	63,838.81	2,273.74	172,378.26	15,987.68
Total Western White Pine Region	Regular	1,500,080.71	628,364.47	105,434.33	93,223.82	71,203.89	50,061.52	58,645.90	41,348.65	48,301.63	39,497.91	114,022.26	17,434.15	173,243.00	59,299.18
	NIRA	664,348.01	595,561.71	4,662.40	3,973.75	902.74	3,293.09			12,226.10			148.36	40,619.94	3,059.92
	ERA	3,267,593.95	3,020,208.14	2,035.62	979.73	307.37		37,173.39		15,085.66	1,456.86			188,663.84	1,683.34
	Total	5,432,022.67	4,244,134.32	112,132.35	98,177.30	72,414.00	53,354.61	95,819.29	41,348.65	75,613.39	40,954.77	114,022.26	17,582.61	402,426.78	64,042.44
Colorado	Regular	11,852.04	5,509.48		700.00			611.65		1,226.64	136.68			2,606.40	1,061.19
	NIRA	8,041.45		823.28	52.00	6,422.74				100.00				520.43	123.00
	ERA	59,396.51	54,444.49		124.11	15.11				511.99				4,175.81	125.00
	Total	79,290.00	59,953.97	823.28	876.11	6,437.85		611.65		1,838.63	136.68			7,302.64	1,309.19
Wyoming	Regular	9,803.82	4,318.27		700.00	598.64		214.11		359.84	47.86			2,567.14	997.97
	NIRA	7,107.41			191.42	5,641.49				100.00				1,061.50	123.00
	ERA	68,383.75	64,251.13			30.60				193.22				3,734.87	173.93
	Total	75,294.98	58,569.40		891.42	6,270.73		214.11		653.06	47.85			7,353.51	1,294.90
Total Central Rocky Mountain Region	Regular	21,665.86	9,827.75		1,400.00	598.64		625.76		1,586.48	184.53			5,173.54	2,059.16
	NIRA	15,148.86		823.28	243.42	12,064.23				200.00				1,571.93	246.00
	ERA	117,780.26	108,695.62		124.11	45.71				705.21				7,910.68	298.93
	Total	154,584.98	118,523.37	823.28	1,767.53	12,708.58		825.76		2,491.69	184.53			14,656.15	2,604.09
Total Northwestern Region	Regular	1,521,736.57	638,192.22	105,434.33	94,623.82	71,802.53	50,061.52	59,471.66	41,348.65	49,888.11	39,682.44	114,022.26	17,434.15	178,416.54	61,358.34
	NIRA	679,496.87	596,561.71	5,485.68	4,217.17	12,966.97	3,293.09			12,426.10			148.36	42,091.87	3,305.92
	ERA	3,385,374.21	3,128,903.76	2,035.62	1,103.84	353.08		37,173.39		15,790.87	1,456.86			196,574.52	1,982.27
	Total	$5,586,607.65	$4,362,657.69	$112,955.63	$ 99,944.83	$85,122.58	$53,354.61	$96,645.05	$41,348.65	$78,105.08	$41,139.30	$114,022.26	$17,582.51	$417,082.93	$66,646.63

TABLE NO. 1

SUMMARY OF 1939 RIBES ERADICATION

State	Initial Eradication Work				Reeradication Work				Totals				Percent Initial Eradication Worked
	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	
		Wild	Cultivated			Wild	Cultivated			Wild	Cultivated		
Idaho	27,434	10,947,319	-	51,337	62,331	12,579,138	-	83,686	89,766	23,526,452	-	135,023	1.2
Montana	4,718	1,269,724	-	8,418	1,017	105,019	-	1,281	5,735	1,374,743	-	9,699	2.1
Washington	3,938	1,972,650	-	8,309	5,428	1,503,037	-	5,273	9,366	3,475,687	-	13,582	2.3
Total	36,090	14,189,693	-	68,064	68,776	14,187,189	-	90,240	104,866	28,376,882	-	158,304	1.3

State	Ribes Per Acre		Man Days Per Acre		Number of Camps				Number of Employees					
	Initial Eradication	Reeradication	Initial Eradication	Reeradication	C.C.C.	W.P.A.	Regular	Total	Laborers C.C.C.	Laborers W.P.A.	Laborers Regular	Laborers Total	All Supervision	Total Employees
Idaho	399	202	1.87	1.34	22	20	28	70	1,225	1,331	969	3,525	255	3,780
Montana	269	103	1.78	1.26	4	2	1	7	145	100	50	295	21	318
Washington	501	277	2.11	.97	4	1	2	7	241	92	62	395	25	420
Total	393	206	1.89	1.31	30	23	31	84	1,611	1,523	1,081	4,215	301	4,516

TABLE NO. 1A

SUMMARY OF ALL RIBES ERADICATION 1918-1939 (INCLUSIVE)

State	Total Acreage White Pine	Acreage White Pine Worth Protection	Acreage Control Areas (White Pine and Protective Zones)	Acreage Reported Initially Worked	Initial Eradication Work			
					Net Acreage Worked in Control Areas	Number Ribes Destroyed		Number 8-Hour Man Days
						Wild	Cultivated	
Colorado	550,000*	206,000*	206,000*	14,859	14,859	410,649	-	6,292
Idaho	2,307,415	2,307,415	2,307,415	1,601,721	1,601,721	311,662,182	-	1,266,412
Montana	220,740	220,740	220,740	112,279	112,279	15,032,132	-	75,601
Washington	171,250	171,250	171,250	112,694	112,694	24,683,611	-	95,473
Wyoming	3,754,000*	304,000*	304,000*	21,760	21,760	1,085,771	-	6,940
Total	7,003,405	3,209,405	3,209,405	1,863,313	1,863,313	352,874,345	-	1,450,718

State	Reeradication				Totals				Percent Initial Eradication Worked	Per Acre			
	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Net Acreage Worked in Control Areas	Number Ribes Destroyed		Number 8-Hour Man Days		Ribes		Man Days	
		Wild	Cultivated			Wild	Cultivated			Initial Eradication	Reeradication	Initial Eradication	Reeradication
Colorado	1,962	86,886	-	664	16,821	497,535	-	6,956	7.2	28	44	.42	.34
Idaho	247,408	39,470,062	-	253,547	1,849,129	351,132,244	-	1,519,959	69.4	195	160	.79	1.02
Montana	5,958	955,695	-	8,089	118,237	15,987,827	-	83,690	50.9	134	160	.67	1.36
Washington	22,253	3,624,092	-	21,928	134,947	28,307,703	-	117,401	65.8	219	163	.85	.99
Wyoming	-	-	-	-	21,760	1,085,771	-	6,940	7.2	50	-	.31	-
Total	277,581	44,136,735	-	284,228	2,140,894	397,011,080	-	1,734,946	58.1	189	159	.78	1.02

*Incomplete

TABLE NO. 2

SUMMARY OF 1939 RIBES ERADICATION BY PROGRAMS
(Including All Work - Initial and Reeradication)

State	Total Acreage Worked (Initial and Reeradication)	Regular and Cooperative				W.P.A. and E.R.A.			
		Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days
			Wild	Cultivated			Wild	Cultivated	
Idaho	89,765	33,363	7,273,097	-	48,476	40,136	10,027,217	-	53,195
Montana	5,735	2,396	620,578	-	3,776	2,042	533,597	-	3,467
Washington	9,366	2,669	920,496	-	3,171	3,565	1,618,308	-	4,003
Total	104,866	38,428	8,714,171	-	55,423	45,743	12,179,122	-	60,665

State	E.C.W.				Totals			
	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days
		Wild	Cultivated			Wild	Cultivated	
Idaho	16,266	6,226,138	-	33,352	89,765	23,526,452	-	135,023
Montana	1,297	320,568	-	2,456	5,735	1,374,743	-	9,699
Washington	3,132	936,883	-	6,408	9,366	3,475,687	-	13,582
Total	20,695	7,483,589	-	42,216	104,866	28,376,882	-	158,304

TABLE NO. 2A

SUMMARY OF ALL RIBES ERADICATION BY PROGRAMS 1918-1939 (INCLUSIVE)
(Initial and Reeradication)

State	Total Acreage Reported Worked (Initial and Reeradication)	Regular and Cooperative				W.P.A. and E.R.A.			
		Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days
			Wild	Cultivated			Wild	Cultivated	
Colorado	16,821	-	-	-	-	16,821	497,535	-	6,956
Idaho	1,849,129	462,628	83,595,922	-	324,328	460,324	83,817,830	-	360,983
Montana	118,237	9,014	2,007,979	-	11,940	52,243	5,726,572	-	36,061
Washington	134,947	5,938	2,414,798	-	9,286	35,869	13,105,297	-	49,264
Wyoming	21,760	-	-	-	-	21,760	1,085,771	-	6,940
Total	2,140,894	477,580	88,018,699	-	345,554	587,017	104,233,005	-	460,204

State	E.C.W.				P.W.A. or N.R.A.				Total Emergency Program (W.P.A.-E.C.W.-P.W.A.)			
	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days
		Wild	Cultivated			Wild	Cultivated			Wild	Cultivated	
Colorado	-	-	-	-	-	-	-	-	16,821	497,535	-	6,956
Idaho	574,336	121,476,220	-	626,198	351,841	62,242,272	-	208,450	1,386,501	267,536,322	-	1,195,631
Montana	12,992	1,410,967	-	10,873	43,988	6,842,309	-	24,816	109,223	13,979,848	-	71,750
Washington	31,990	4,580,854	-	34,432	61,150	8,206,754	-	24,419	129,009	25,892,905	-	108,115
Wyoming	-	-	-	-	-	-	-	-	21,760	1,085,771	-	6,940
Total	619,318	127,468,041	-	671,503	456,979	77,291,335	-	257,685	1,663,314	308,992,381	-	1,389,392

TABLE NO. 3

SUMMARY OF ALL OTHER CONTROL WORK FOR 1939

State	Cultivated Black Currant Eradication				Nursery Sanitation						Preeradication Survey	
	Number Inepections Made	Number Locatione Found	Number Black Currants Destroyed	Number 8-Hour Man Daye	Number Nureeries Worked	Number White Pines in Nurseries	Number Acree Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Number Acres Mapped White Pine and Protection Zones	Number 8-Hour Man Daye
								Wild	Cultivated			
Idaho	-	-	-	-	-	-	-	-	-	-	36,490	83
Montana	-	-	-	-	1	13,366,000	548	6,861	-	122	12,825	232
Washington	-	-	-	-	-	-	-	-	-	-	1,200	8
Total	-	-	-	-	1	13,366,000	548	6,861	-	122	50,515	323

No data to be reported on second part of table 3.

TABLE NO. 3A

SUMMARY OF ALL OTHER CONTROL WORK 1918-1939 (INCLUSIVE)

State	Cultivated Black Currant Eradication				Nursery Sanitation							
					Number of Nureeries		Number Acres Worked			Number Ribee Destroyed		
	Number Inspections Made	Number Locations Found	Number Black Currants Deetroyed	Number 8-Hour Man Days	Sanitation Zone Maintained	Sanitation Zone Abandoned	Nureeriee Maintaining Zonee	Nurseries Which Abandoned Zonee	Total Acreage	Wild	Cultivated	Number 8-Hour Man Days
Colorado	-	-	-	-	-	-	-	-	-	-	-	-
Idaho	5,233	2,471	16,553	2,341	-	-	-	-	-	-	-	-
Montana	1,311	798	5,080	514	1	-	8,186	-	8,186	1,330,873	-	6,666
Washington	50,050	5,378	78,226	4,218	1	-	378	-	378	20,275	-	640
Wyoming	-	-	-	-	1	-	2,038	-	2,038	73,786	-	567
Total	56,594	8,647	99,859	7,073	3	-	10,602	-	10,602	1,424,934	-	7,873

State	Preeradication Survey		Treatment Infected White Pine				
	Number Acres Mapped White Pine and Protection Zones	Number 8-Hour Man Days	Number Trees Examined	Number Treee Treated	Number Trees Removed	Number Cankers Removed	Number 8-Hour Man Days
Colorado	206,000	290	-	-	-	-	-
Idaho	3,252,330	3,855	-	-	-	-	-
Montana	259,675	798	-	-	-	-	-
Washington	146,541	342	-	-	-	-	-
Wyoming	317,900	329	-	-	-	-	-
Total	4,182,446	5,614	-	-	-	-	-

TABLE NO. 4

SUMMARY EXPENDITURES FOR 1939

State	Total			Recapitulation By Program (Federal Only)					
					Emergency Program				
	Federal	State (Including All Cooperative Funds)	Grand Total	Regular	W.P.A. and E.R.A.	E.C.W.	P.W.A.	N.Y.A.	Total
Colorado	$ 1,341.63	-	$ 1,341.63	$ 866.64	$ 474.99	-	-	-	$ 474.99
Idaho	776,445.21	$15,438.04	790,883.25	388,872.01	386,573.20	-	-	-	386,573.20
Montana	70,500.37	-	70,500.37	40,943.16	29,657.21	-	-	-	29,557.21
Washington	74,243.20	-	74,243.20	29,927.34	44,315.86	-	-	-	44,315.86
Total	$921,530.41	$15,438.04	$936,968.45	$460,609.15	$460,921.26	-	-	-	$460,921.26

State	Recapitulation By Activities (Federal and State)						
	Supervision Including State and District Leaders	Ribes Eradication	Cultivated Black Currant Eradication	Nursery Sanitation	Canker Elimination	Preeradication Survey	All Other (Checking, Field Data and Miscellaneous)
Colorado	$ 866.64	-	-	-	-	-	$ 474.99
Idaho	45,107.18	$708,600.90	-	-	-	$ 1,594.94	35,580.23
Montana	6,480.00	58,442.39	-	-	-	1,392.00	4,186.98
Washington	3,815.72	45,878.90	-	-	-	84.00	24,464.58
Total	$56,269.54	$812,922.19	-	-	-	$ 3,070.94	$64,705.78

TABLE NO. 4A

SUMMARY OF ALL EXPENDITURES 1918-1939 (INCLUSIVE)

State	Total			Recapitulation By Programs (Federal Only)				
	Federal	State (Including All Cooperative Funds)	Grand Total	Regular	W.P.A., C.W.A. and E.R.A.	E.C.W.	P.W.A.	Total Emergency Programs (WPA-ECW-PWA)
Colorado	$ 79,290.00	-	$ 79,290.00	$ 11,852.04	$ 59,396.51	-	$ 8,041.45	$ 67,437.96
Idaho	7,786,570.96	$210,497.65	7,997,068.61	2,907,587.17	3,038,958.01	-	1,840,025.78	4,878,983.79
Montana	816,754.97	-	816,754.97	279,120.32	299,469.80	-	238,164.85	537,634.65
Washington	916,591.81	-	916,591.81	272,366.23	404,706.30	-	239,520.28	644,226.58
Wyoming	75,294.98	-	75,294.98	9,803.82	58,383.75	-	7,107.41	65,491.16
Total	$9,674,502.72	$210,497.65	$9,885,000.37	$3,480,728.58	$3,860,914.37	-	$2,332,859.77	$6,193,774.14

State	Recapitulation By Activities (Federal and State)						
	Supervision (Including State and District Leaders)	Ribes Eradication	Cultivated Black Currant Eradication	Nursery Sanitation	Canker Elimination	Preeradication Survey	All Other (Checking, Field Data and Miscellaneous)
Colorado	$ 12,826.89	$ 49,302.91	-	-	-	$ 6,437.85	$ 10,722.35
Idaho	396,430.06	6,963,542.61	$ 28,173.15	-	-	60,339.26	548,583.54
Montana	45,453.41	609,635.73	22,010.30	$16,588.77	-	13,302.91	109,763.85
Washington	36,401.13	544,991.09	63,838.81	2,273.74	-	5,077.77	264,009.27
Wyoming	11,570.07	46,825.86	-	-	-	6,270.73	10,628.32
Total	$502,681.55	$8,214,298.20	$114,022.26	$18,862.51	-	$91,428.52	$943,707.33

TABLE NO. 4B

STATUS OF BLISTER RUST CONTROL 1918-1939 (INCLUSIVE)

State	Control Area Including Border Zones (Acres)	Net Control Area Initially Protected (Acres)	Control Areas Reworked Subsequent to Initial Protection (Acres)	Number 8-Hour Man Days (Man Days)	Ribes Destroyed (Wild and Cultivated) (Number)	Remaining Control Area Needing Initial Protection (Acres)	Estimated Protected Area Now on Maintenance Basis (Acres)
Colorado	206,000*	14,859	1,962	6,956	497,535	191,141	8,000
Idaho	2,307,415	1,601,721	247,408	1,519,959	351,132,244	705,694	649,589
Montana	220,740	112,279	5,958	83,690	15,987,827	108,461	56,834
Washington	171,250	112,694	22,253	117,401	28,307,703	58,556	40,960
Wyoming	304,000*	21,760	-	6,940	1,085,771	282,240	9,000
Total	3,209,405	1,863,313	277,581	1,734,946	397,011,080	1,346,092	764,383

*Incomplete


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REPORT OF BLISTER RUST CONTROL ACTIVITIES

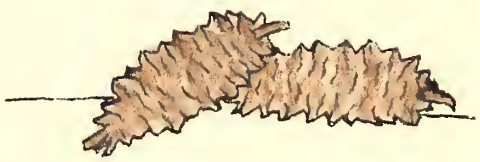
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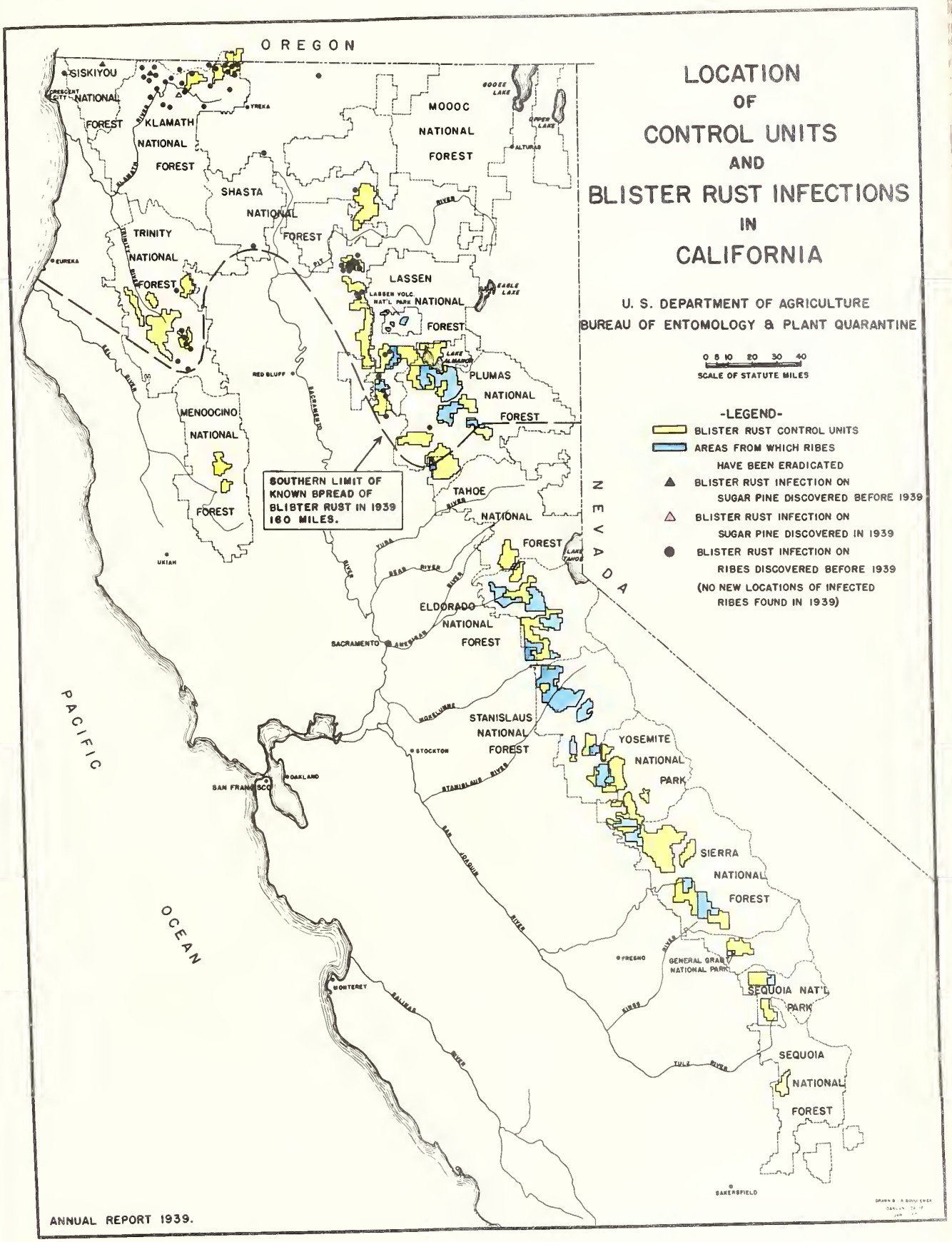
SUGAR PINE REGION

1939

Regional Office of the Sugar Pine Region
Division of Plant Disease Control
Bureau of Entomology and Plant Quarantine
United States Department of Agriculture
610 Syndicate Building
Oakland, California







ANNUAL REPORT 1939.

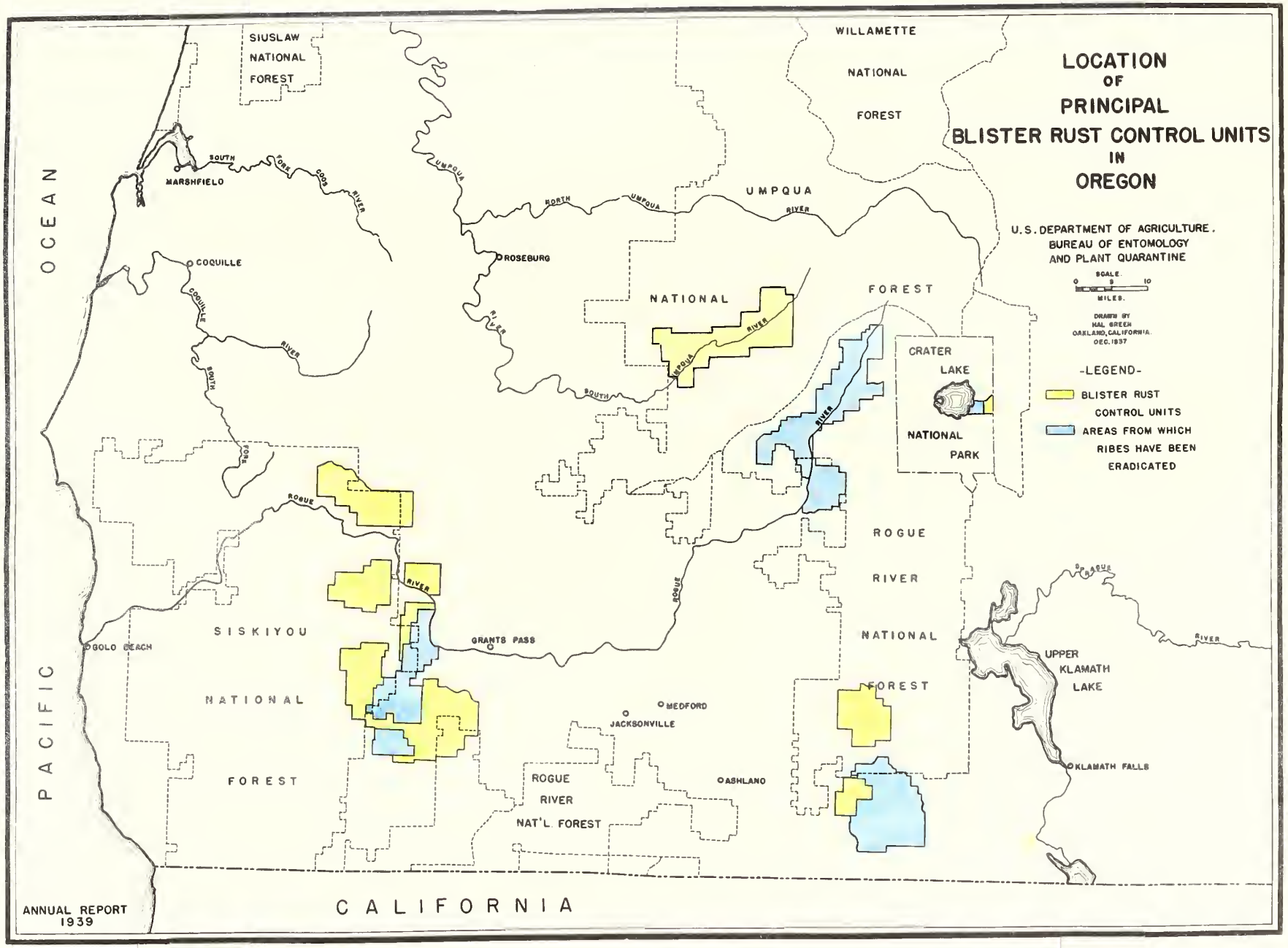

LOCATION
OF
PRINCIPAL
BLISTER RUST CONTROL UNITS
IN
OREGON
U.S. DEPARTMENT OF AGRICULTURE.
BUREAU OF ENTOMOLOGY
AND PLANT QUARANTINE
SCALE.
0 5 10
MILES.
DRAWN BY
HAL GREEN
OAKLAND, CALIFORNIA.
DEC. 1937
-LEGEND-
BLISTER RUST CONTROL UNITS
AREAS FROM WHICH RIBES HAVE BEEN ERADICATED
OCEAN
PACIFIC
SIUSLAW NATIONAL FOREST
WILLAMETTE NATIONAL FOREST
UMPQUA NATIONAL FOREST
ROGUE RIVER NATIONAL FOREST
SISKIYOU NATIONAL FOREST
ROGUE RIVER NAT'L. FOREST
CRATER LAKE NATIONAL PARK
MARSHFIELD
COQUILLE
ROSEBURG
GRANTS PASS
GOLD BEACH
MEDFORD
JACKSONVILLE
ASHLAND
KLAMATH FALLS
UPPER KLAMATH LAKE
SOUTH COOS RIVER
COQUILLE RIVER
SOUTH FORK COQUILLE RIVER
NORTH UMPQUA RIVER
SOUTH UMPQUA RIVER
ROGUE RIVER
KLAMATH RIVER
CALIFORNIA
ANNUAL REPORT
1939

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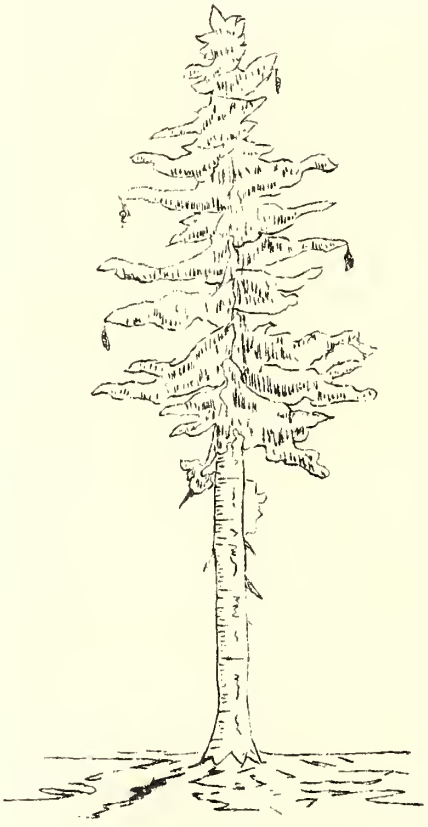
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BLISTER RUST CONTROL IN THE SUGAR PINE REGION 1939

PART I - GENERAL

By

Warren V. Benedict, Senior Forester



In the Sugar Pine Region, which comprises the States of California and Oregon, three agencies during 1939 engaged actively in blister rust control work: the Bureau of Entomology and Plant Quarantine and the Forest Service of the U. S. Department of Agriculture, and the National Park Service of the U. S. Department of the Interior. The State of Oregon through its Board of Forestry and Department of Agriculture, and the State of California through its Division of Forestry, Department of Agriculture, and through the University of California furthered the control activities of the Bureau by contributing such facilities and services as laboratory space, office space, technical facilities, and border quarantine inspection. Private owners of sugar pine timber, although making no pecuniary contribution, evinced a live interest in protective measures and cooperated in sundry ways.

The agreement dated April 27, 1938 between the Bureau and Region IV of the Park Service governing the cooperative relations of the two agencies in the conduct of control work in the national parks remained in effect throughout 1939. A revised working plan, dated March 15, 1939, and based on the inter-bureau agreement of May 26, 1937, between the Bureau and the Forest Service redefined and clarified the cooperative status of the two agencies performing control work in the national forests of California. In these agreements the position of the Bureau as technical leader, advisor, and coordinator of all blister rust control work in the Sugar Pine Region was recognized as heretofore.

Control activities of the Forest Service in California were confined to Ribes eradication on lands predominantly in Federal ownership on the Lassen, Plumas, Eldorado, Stanislaus, and Sierra National Forests. The work was financed by allotments of regular (Protection and Management) and Emergency Relief Appropriation Act funds, and by assignment of enrollees of the Civilian Conservation Corps. Because of need for Ribes reeradication on the several operations was rapidly becoming acute, the Forest Service devoted its attention almost exclusively to the reeradication of Ribes from control units that had already received an initial working.

In Oregon no work was undertaken by the Forest Service, but in Washington a small Ribes reeradication job at the Wind River Nursery and Arboretum was performed by the Northwest Forest and Range Experiment Station of the Forest Service and supervised by the Bureau. The Bureau's technical men were available for consultation on the Forest Service operations and lent assistance in other ways. A spirit of unanimity and warm cooperation existed between the Forest Service staff men and the Bureau's technical men: the Bureau wishes to acknowledge the part the Forest Service has taken in fostering the friendly and helpful relationship which subsists between the organizations.

The Park Service conducted Ribes eradication by means of the Civilian Conservation Corps in Lassen Volcanic, Yosemite, General Grant, and Sequoia National Parks. Considerable interest was shown by the blister rust foremen in Yosemite Park in developing a special-purpose eradication tool, which, after several trials, was used successfully. Marginal white pine types in the eastern part of Lassen Park (in the vicinity of Horseshoe Lake and Twin Lakes) were given an advance check under the supervision of the Bureau in order to supply data that would assist the Park Service to define a possible control unit; particular attention in the survey was paid to a white pine count. In Sequoia Park two members of the Bureau's technical staff and a member of the Forester's office of the Park Service made an extensive survey of stands of foxtail pine (Pinus balfouriana Murray) in the Kern River Basin for the purpose of studying the feasibility of blister rust control. Foxtail pine is a high mountain white pine occupying a narrowly restricted range on the plateaus and mountain slopes of the High Sierra from an elevation of 8,500 feet to timberline; it is valuable as a watershed protector, but principally as a recreational, aesthetic asset of first importance. Descriptions of the principal pine stands and of Ribes conditions, and recommendations for control units were embodied in a special report. Three Bureau advisors gave technical assistance to the work in the Parks: Conrad P. Wessela for Crater Lake Park (no control work was done in this Park this year); Benton Howard for Lassen Volcanic Park; and Frank A. Patty for Yosemite, General Grant, and Sequoia National Parks. Cooperative relations between the personnel of the Park Service and the Bureau both in the field and in the Regional offices were most cordial at all times. Sequoia Park supplied the pack stock for the high country survey party, and Park personnel were of great help in planning, organizing, and carrying out the trip. In Yosemite Park, where the largest Ribes eradication operation was conducted, the Park Forester, who was in charge of control work in Yosemite and other Park personnel, cooperated to the full in carrying out the recommendations of the Bureau.

As the small amount regular funds allotted to the Bureau was required for the maintenance of fixed overhead, it was necessary to finance practically all field work of the Bureau both in California and in Oregon with allotments of ERA money. Moreover, because of restricting regulations and pay rates of the WPA that prevented the Bureau in California from operating in the counties in which it had formerly conducted control operations, and in which, it might be added, reeradication work was overdue, the Bureau was forced to confine its entire program to initial eradication work in Fresno county in the southern part of the Sierra National Forest.

Mr. Douglas R. Miller was the operation supervisor in charge, and Glenn J. Taylor directed all checking work. The sugar pine stands treated are those of high priority in the neighborhood of Shaver Lake and Dinkey Creek; in the basin of Dinkey Creek the stands are virgin, but about Shaver Lake they had been logged some years previous; the cut-over lands support a good growth of young sugar pine. Some promising experiments were made with mechanical power eradication in dense growths of large Ribes roezli near Shaver Lake; a D-2 Caterpillar tractor rented from the Forest Service was equipped with a Ribes rake and a light, portable grapple operating on a cable attached to a drum. The results indicate that the unit can be used advantageously in accessible dense populations of large Ribes. The Bureau gratefully acknowledges the friendly assistance given by the Forest Service staff of the Sierra Forest to the Bureau operations.

In Oregon the Bureau continued an ERA project on the Rogue River National Forest that concluded all current eradication work on the Upper Rogue River Unit by the end of the season. A new ERA project on predominantly private lands near the Siskiyou National Forest south and west of Grants Pass was initiated during 1939. This project was operated as a Bureau ERA project until June 30; on July 1, because of insufficient ERA funds, the project was refinanced under the WPA program of the State of Oregon with the Bureau as sponsor. As a result of an inspection trip taken with representatives of the Oregon and California Revested Lands Administration and Region VI of the Forest Service to the white and sugar pine stands of the Siskiyou and Rogue River National Forests, these agencies received a better understanding of the extent, character, and value of the stands in their stewardship and to the possibility of protecting them from blister rust.

Insofar as revealing new infections of blister rust or advancing southward its known extent in California are concerned, the results of scouting during the late summer and fall of 1939 were negative. One small diseased sugar pine was found at a new location on the Klamath National Forest, and the spread of the disease at the site of the old infection on Indian Creek was studied. The prolonged early drought and hot weather, and the lack of favorable winds during the main period of aeciospore production were probably responsible for the comparative inactivity of the rust in California.

During the year, several reports and studies were made by the Bureau's regular staff that are worthy of mention. Among the special reports may be noted:

1. ADVANCE CHECKING ON THE TAHOE NATIONAL FOREST IN 1938, by John C. Crowell; a report of a cooperative advance survey by the Forest Service and the Bureau of the Forest Hill Divide control unit (sugar pine).

2. ADVANCE CHECKING ON YOSEMITE NATIONAL PARK IN 1938, by Thomas H. Harris and Carl W. Fowler; a report of a cooperative survey by the Park Service and the Bureau of western white and white bark pine types of the high Sierra.

3. ADVANCE CHECKING IN SEQUOIA NATIONAL PARK IN 1938, by John N. Mitchell; a report of a cooperative survey by the Park Service and the Bureau of sugar pine types in Giant Forest and Atwell Mill districts.

4. RECOMMENDATIONS FOR BLISTER RUST CONTROL WORK IN CRATER LAKE NATIONAL PARK, OREGON, by Conrad P. Wessela and Lyle N. Anderson; reporting upon a preeradication survey of the Cloud Cap and the proposed Annie Creek control units.

5. MAINTAINING PRECISION IN CHECKING THROUGH STRIP RETRACEMENTS, by John N. Mitchell; a description of the method used in the Sugar Pine Region for maintaining the necessary standard of accuracy in checking work.

6. Several papers by staff men of the Forest Service and the Bureau discussing a basis for the determination of priority of treatment of sugar pine control units.

An atlas of blister rust control information for the national parks similar to that covering the national forests was compiled and distributed to the National Parks in the Sugar Pine Region, and the Forest Service Atlas was brought up to date. In February a joint conference of Region V Forest Service personnel concerned in control work and the Bureau's technical staff was held in San Francisco to discuss a new local cooperative agreement, the determination of priority of treatment of control units, the functions of the Forest Service and Bureau staff men, and all matters relevant to the cooperative work on the national forests.

A new understanding was reached with the Forest Service regarding the employment of checkers. It was agreed, in view of the Bureau's responsibility for checking work and checking surveys, and in view of the patent advantages of a single administration of this phase of control work, that the Bureau should handle the employment of checkers--that is, hire and pay the salaries from Bureau funds of all men engaged in checking work--and that the Forest Service would reimburse the Bureau for checking done on national forest lands. The new system freed the Bureau's checking supervisors from responsibility for the work of men paid by the Forest Service (except in the case of CCC checkers) the system worked satisfactorily.

Educational work throughout the year was active. Lantern slide talks were given to science classes, schools, clubs, civic organizations, and blister rust control camps. Two large display posters using colored photographs of control work with brief captions were prepared, one of which was distributed to cooperating and interested agencies. A motion picture projector was purchased and a motion picture camera was acquired jointly by the Sugar Pine Region and the Northwestern Region. In preparation for a blister rust movie, colored motion pictures were taken of control activities, sugar pine stands, and lumbering operations in the Sierra Nevada. Throughout the winter, work progressed on the photographing of captions, animated scenes, and sugar pine products, and on the assembling of the film.

The Bureau's full time, appointed personnel engaged in control work in the Sugar Pine Region were assigned as follows:

General Supervision:

Warren V. Benedict, Senior Forester.....Regional Leader in Charge
Thomas H. Harris, Forester .....Assist. Regional Leader and Regional Checking Supervisor

Oregon Operation:

Conrad P. Wessela, Associate Forester .....Operation Supervisor
Robert Sovulewski, Agent ....Assist. Operation Supervisor
Lyle N. Anderson, Agent .....Checking Supervisor

California Operations:

Lassen Volcanic National Park, Lassen and Plumas National Forests

Benton Howard, Associate Forester .....Operation Supervisor
S. Daryl Adams, Agent .....Checking Supervisor (Plumas)
John C. Crowell, Agent .....Checking Supervisor (Lassen Forest and Park)

Eldorado and Stanislaus National Forests

Roy Blomstrom, Associate Forester .....Operation Supervisor
Carl W. Fowler, Assistant Forester .....Checking Supervisor

Yosemite, General Grant, and Sequoia National Parks

Frank A. Patty, Associate Pathologist .....Operation Supervisor
John N. Mitchell, Assistant Forester .....Checking Supervisor

Sierra National Forest

Douglas R. Miller, Associate Forester .....Operation Supervisor
Winfield B. Dunshee, Agent .....Unit Supervisor
Glenn J. Taylor, Agent .....Checking Supervisor

Developmental Work in Control Methods (Berkeley Office)

Harold R. Offord, Pathologist .....In Charge
Clarence R. Quick, Assistant Pathologist
Lawrence P. Winslow, Agent
Catherine Ryan, Jr. Clerk-Stenographer

Office Administration, Oakland Regional Office

Ralph H. Simons, Jr. Administrative Assist....	In Charge of administrative, fiscal, and clerical;
assisted by	
Orvis R. Decious, Clerk	Bookkeeping
Fred R. Arey, Assist Clerk	Procurement (Furloughed - December 4, 1939)
Ernest G. Pinnella, Agent	Property, Warehouse Foreman
Loa H. Smith, Assist. Clerk	Pay rolls
Ethelyn Warner, Assist. Clerk	Pay rolls (Resigned - August 29, 1939)
Juliana Arca, Jr. Clerk-Stenographer	
Rose E. Yaras, Clerk-Stenographer	Secretarial, Personnel In Charge of stenographic force
Frances H. Greenfield, Assist. Clerk-Stenographer	Secretarial, files, expense accounts, leave records
Eudora S. DeTonnencourt, Jr. Clerk-Stenographer	

The Forest Service staff officers in charge of blister rust control work were assigned as follows:

Ralph A. James, Assistant Forester	Plumas National Forest
Eugene H. Kincaid, Agent.....	Eldorado National Forest
Charles E. M. Carlson, Junior Range Examiner .	Stanislaus National Forest
Arthur London, Assistant Forester	Sierra National Forest

In accord with the cooperative agreement between Region V of the Forest Service and the Sugar Pine Regional office of the Bureau, reimbursement was made to the Bureau by the Forest Service for the cost of checking supervision given by Bureau men to the work on national forest land. Salaries and expenses of checking supervisors Carl W. Fowler, Assistant Forester and S. Daryl Adams, Agent, for 1939 were thus paid by the Forest Service on a reimbursement basis, similarly the salary and expenses of Eugene Kincaid, Agent, who was assigned as Forest Service staff man on the Eldorado National Forest, were borne by the Forest Service.

The special omnibus summaries of blister rust activities in the Sugar Pine Region, inaugurated in 1936 by the Washington office of the Division of Plant Disease Control of the Bureau, have been revised to include data on accomplishments of 1939. Omnibus Tables numbered 1 and 1-A to 4 and 4-A, 4-B, and 5 inclusive, appear at the end of this section of the annual report beginning on page 29.

The detailed results of Ribes eradication, advance, regular, and post checking, scouting, special surveys, and methods development are discussed in separate sections of this report as follows:

Part II -- Ribes Eradication: By Roy Blomstrom and Conrad P. Wessela, Associate Foresters

Part III-- Checking: By Carl W. Fowler, Assistant Forester and S. Daryl Adams, Agent

Part IV -- Scouting: By John C. Crowell and Harry G. Lachmund, Agents

Part V -- Methods Development: By Harold R. Offord, Pathologist

MEMORANDA OF AGREEMENT

Between the

Bureau of Entomology and Plant Quarantine

and

Oregon

1. Oregon State Board of Forestry, Salem, Oregon

2. Bureau of Plant Industry, Oregon State Department of Agriculture, Salem, Oregon

California

1. Division of Forestry, California Department of Natural Resources, Sacramento, California

2. California Department of Agriculture, Sacramento, California

3. College of Agriculture, University of California, Berkeley, California

4. Botanical Garden, University of California, Berkeley, California

5. Department of Botany, University of California, Berkeley, California

****

Working Plan for the Cooperative Conduct of Blister Rust Control in California by the Bureau of Entomology and Plant Quarantine and the Forest Service; March 15, 1939.

For the memorandum of April 27, 1938 to National Park Superintendents by Frank A Kittredge, Regional Director, regarding the cooperative relationship of the Bureau and the Park Service, see "Report of Blister Rust Control Activities in the Sugar Pine Region, 1938," pp. 12-15.

July 5, 1939

State Forester J. W. Ferguson, Jr.,
Oregon State Board of Forestry,
Salem, Oregon.

Dear Mr. Ferguson:

The Memorandum of Agreement between this Bureau, the Bureau of Plant Industry, Oregon State Department of Agriculture, and the Oregon State Board of Forestry, concerning cooperative work in controlling white pine blister rust, contains a provision for renewal from year to year upon mutual consent of the cooperating agencies.

In order to obviate the necessity of routine year to year renewals in the future, the Bureau suggests that this agreement be amended by substituting for paragraph III the following:

> "This memorandum of agreement shall continue indefinitely unless modified or discontinued by common consent. Requests for termination or any major changes shall be submitted to the other parties for consideration not less than 90 days in advance of the effective date desired."

and by adding a new paragraph V as follows:

> "This memorandum of agreement is to define in general terms the basis on which the agencies concerned will cooperate, and does not constitute a financial obligation to serve as a basis for expenditures. Any and all expenditures from Federal funds in the Department of Agriculture made in conformity with the plans outlined in this memorandum of agreement must be in accord with Department Rules and Regulations, and in each instance based upon appropriate finance papers, such as lease, contract, requisition, letter of authorization, etc. Expenditures made by the Oregon State Board of Forestry will be in accord with its rules and regulations."

If the amending of this agreement as above outlined meets with your approval, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

A letter similar to this is being written to the other cooperating agencies.

Very truly yours,

/s/ Avery S. Hoyt

Acting Chief of Bureau

Concurred in:

/s/ J. W. Ferguson
State Forester, Oregon State Board of Forestry

July 5, 1939

Director Frank McKennon,
Bureau of Plant Industry,
Oregon State Department of Agriculture,
Salem, Oregon.

Dear Director McKennon:

The Memorandum of Agreement between this Bureau, the Bureau of Plant Industry, Oregon State Department of Agriculture, and the Oregon State Board of Forestry, concerning cooperative work in controlling white pine blister rust, contains a provision for renewal from year to year upon mutual consent of the cooperating agencies.

In order to obviate the necessity of routine year to year renewals in the future, the Bureau suggests that this agreement be amended by substituting for paragraph III the following:

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If the amending of this agreement as above outlined meets with your approval, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

A letter similar to this is being written to the other cooperating agencies.

Very truly yours,

/s/ Avery S. Hoyt

Acting Chief of Bureau

Concurred in:

/s/ Frank McKennon
Director, Bureau of Plant Industry,
Oregon State Department of Agriculture,

July 5, 1939

State Forester M. B. Pratt,
Division of Forestry,
California Department of Natural Resources,
Sacramento, California.

Dear Mr. Pratt:

The Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California, concerning cooperative work in controlling white pine blister rust, contains a provision for renewal from year to year upon mutual consent of the cooperating agencies.

In order to obviate the necessity of routine year to year renewals in the future, the Bureau suggests that this agreement be amended by substituting for paragraph III the following:

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If the amending of this agreement as above outlined meets with your approval, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

A letter similar to this is being written to each of the other cooperating agencies.

Very truly yours,

/s/ Avery S. Hoyt

Acting Chief of Bureau

Concurred in:

/s/ M. B. Pratt
State Forester, Div. of Forestry, Cal. Dept. of Natural Resources.

July 12, 1939

Director William B. Parker,
California Department of Agriculture,
Sacramento, California

Dear Director Parker:

The Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California, concerning cooperative work in controlling white pine blister rust, contains a provision for renewal from year to year upon mutual consent of the cooperating agencies.

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If the amending of this agreement as above outlined meets with your approval, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

A letter similar to this is being written to each of the other cooperating agencies.

Very truly yours,

/s/ Avery S. Hoyt

Acting Chief of Bureau

Concurred in:

/s/ W. B. Parker
Director, California Dept. of Agriculture.

July 5, 1939

Dean C. B. Hutchison,
College of Agriculture,
University of California,
Berkeley, California.

Dear Dean Hutchison:

The Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California, concerning ccoperative work in controlling white pine blister rust, contains a provision for renewal from year to year upon mutual consent of the cooperating agencies.

In order to obviate the necessity of routine year to year renewals in the future, the Bureau suggests that this agreement be amended by substituting for paragraph III the following:

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If the amending of this agreement as above outlined meets with your approval, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

A letter similar to this is being written to each of the other cooperating agencies.

Very truly yours,

/s/ Avery S. Hoyt

Acting Chief of Bureau

Concurred in:

/s/ C. B. Hutchison
College of Agriculture,
University of California.

July 5, 1939

Dr. T. H. Goodspeed,
Director, Botanical Garden,
University of California,
Berkeley, California

Dear Doctor Goodspeed:

The Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California, concerning cooperative work in controlling white pine blister rust, contains a provision for renewal from year to year upon mutual consent of the cooperating agencies.

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If the amending of this agreement as above outlined meets with your approval, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

A letter similar to this is being written to each of the other cooperating agencies.

Very truly yours,

/s/ Avery S. Hoyt

Actg. Chief of Bureau

Concurred in:

/s/ T. H. Goodspeed
Director, Botanical Garden, Univ. of California.

July 5, 1939

Mr. A. R. Davis, Chairman,
Department of Botany,
University of California,
Berkeley, California.

Dear Mr. Davis:

The Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California, concerning cooperative work in controlling white pine blister rust, contains a provision for renewal from year to year upon mutual consent of the cooperating agencies.

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A letter similar to this is being written to each of the other cooperating agencies.

Very truly yours,

/s/ Avery S. Hoyt

Acting Chief of Bureau

Concurred in:

/s/ A. R. Davis
Chairman, Dept. of Botany, Univ. of California.

S
CONTROL
Disease
Blister Rust

San Francisco, California
March 15, 1939

WORKING PLAN FOR THE COOPERATIVE CONDUCT OF BLISTER RUST CONTROL IN CALIFORNIA BY THE BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE AND THE FOREST SERVICE

I. Basis:

1. This plan is based upon the Memorandum of Understanding of April 19, 1937 between the Bureau of Entomology and Plant Quarantine and the Forest Service

2. Within a National Forest, all large areas selected for control that are predominantly of State and private ownership shall be allotted to the Bureau of Entomology and Plant Quarantine, and those predominantly of Federal ownership shall be allotted to the Forest Service. These large areas assigned to either agency shall be known as "working units," and will be established on the basis of topographical and administrative practicability.

II. Scope and Functions of each Agency:

1. Functions of the Bureau of Entomology and Plant Quarantine.

a. Preparation of a unified plan of control for each National Forest coordinated for the region as a whole in consultation with the Forest Service, other Federal agencies, State agencies, and representatives of private owners.

b. Finance and conduct control work on working units allotted to the Bureau.

c. Experimental development of methods of Ribes eradication.

d. Conduct of disease surveys to determine the rate of progress of disease through a region and the degree of pine infection on any area.

e. Definition of control standards and standards for efficient work in terms of quality and quantity; these standards shall apply to work on both Federal and private lands.

f. Conduct of all types (advance, regular, and post) of checking on both Federal and private lands in order to supply information on the attainment of control standards, and to determine Ribes conditions and populations before, during, and after eradication operations for the preparation of coordinated plans for subsequent control operations both for a National Forest and for the region.

g. The regional compilation, correlation, and maintenance of records relating to the need for and the progress and results of control work on sugar pine lands of whatever ownership. This will be done at the Bureau's Regional Office in Oakland, California.

h. In the capacity of technical advisor, the Bureau shall keep the Forest Service fully informed on such matters as (1) the relative urgency of areas to be worked from the standpoint of blister rust control; (2) the best methods of Ribes eradication for use on specific areas; and (3) any factors affecting the technical application of control operations during their progress. This information shall be furnished to the Forest Supervisor in writing.

2. Scope and Functions of the Forest Service.

a. Finance and conduct Ribes eradication on working units allotted to the Forest Service.

b. Conduct the technical phases of control work in accord with the latest technical knowledge and recommendations submitted in writing by the Bureau of Entomology and Plant Quarantine.

c. Contact owners of private property and request permission to conduct work thereon, and, where necessary, request permission to locate camps thereon.

3. Functions common to both agencies.

a. The activities of both agencies shall be correlated in order to make the work of both as effective as possible. This correlation shall be accomplished for each National Forest by means of a definite plan or agreement which shall be worked out by a representative of the Bureau and a representative of the Forest Supervisor. The plan should provide a solution for problems of camp operation and control work involving both agencies, and should treat all aspects of the cooperative work on a forest that need clarification; it should consider the assignment of working units to each agency, adjustments in assignments, and a real adjustment of

the units. The plan shall be submitted to the regional offices of each agency for approval.

III. Permanent Personnel:

1. The Bureau will provide a technical supervisor and a checking supervisor to handle the control work for which it is responsible on a National Forest or on two or more National Forests, depending upon circumstances, and the Forest Service similarly will provide a staff officer in charge of its control work on one or more Forests. If circumstances make it desirable, the Bureau may vest its responsibilities of technical supervision and checking in one man for one or more National Forests. The Forest Service will pay the salaries of its administrative officers and will reimburse the Bureau for the supervision of checking done on National Forest lands by transfer of funds in an amount proportional to the amount of supervision given by checking supervisors referred to in this paragraph.

2. Duties of the Bureau technical supervisor:

a. To be responsible to the Bureau's regional representative for the general leadership of the blister rust control program on a National Forest.

b. To prepare with the Forest Service staff officer a plan for control work on the National Forest; the plan shall consist of two correlated parts, one relating to working units allotted to the Forest Service and the other to units allotted to the Bureau. The Bureau technical supervisor and the Forest Service blister rust staff officer shall each be responsible for that part relating to his agency, and each shall consult with the other on points on which he is qualified to advise. The plan shall give consideration to (1) plans for logging, fire protection, land exchange, recreation, and power development; and (2) priority of treatment within and among working units.

c. To be responsible for the establishment and the operation of Bureau camps and for work done therefrom.

d. To keep himself thoroughly informed of all conditions affecting the need for and results and progress of Ribes eradication and reeradication on Federal as well as on State and private lands.

e. To advise the Forest Supervisor by means of memoranda on all technical phases of control work and to keep the Supervisor informed of the activities, findings, and recommendations as to the need for and progress and efficiency of blister rust control work on the Forest.

3. The Duties of the Forest Service blister rust staff officer.

a. To work in collaboration with the Bureau technical supervisor in the preparation of the plan for control work on the National Forest as described under III-2-b, above.

b. To be responsible to the Forest Supervisor for all phases of the administration of control work on working units allotted to the Forest Service, including:

(1) Location and construction of camps.

(2) Hiring of personnel, except checkers.

(3) Care of all equipment and truck needs.

(4) Direction of all field work except checking under the policies that have been outlined.

c. The compilation and maintenance of all records necessary to carry out the program on the Forest.

4. The checking supervisor assigned to a Forest shall be responsible to the Bureau's regional checking supervisor, and shall have as his duties the supervision and direction of checking work for all Bureau and Forest Service camps. The checking supervisor shall keep in touch with the Forest Service staff officer and with the Bureau technical supervisor in order to insure uniformity in standards of efficiency and to assist in the interpretation of checking data.

IV. Temporary Personnel and Labor.

1. Supervisory personnel and checkers.

a. The Bureau will hire and pay the salaries of the supervisory personnel necessary to administer its work, and the Forest Service similarly will employ the supervisory personnel for its work.

b. All checkers for the Bureau and Forest Service camps will be selected by the Bureau, consideration being given, as regards Forest Service camps, to recommendations of the Forest Supervisors. Checkers will be directly responsible to the Bureau's checking supervisor for their work. In all camps the checkers will be under the supervision of the camp superintendent except when performing their checking work. The checking supervisor may move checkers between the camps of both agencies on a Forest at his discretion in accord with the exigencies of checking work. The salaries of checkers in Forest Service camps will be paid directly by the

Forest Service or by mutual agreement may be paid by the Bureau with appropriate reimbursement by the Forest Service. In delegating to the Bureau responsibility for handling the checking work in control units assigned to the Forest Service it is understood that no financial obligations on this account will be incurred without the advance approval in writing of the Regional Forester or his authorized representative.

c. Temporary personnel needed to facilitate the operations of both agencies may be hired jointly by both and the cost of their services will be prorated equitably between the agencies. This provision applies to such positions as that of warehouseman for a jointly operated warehouse, field clerk, and the like.

2. Labor.

Each agency shall pay the wages of the laborers employed in its camps. Labor should be procured under a joint agreement in order to assure its equitable distribution to both agencies.

V. Project Operation and Supply:

1. Each agency will finance its own camps, all control work done therefrom, and all work for which it is definitely responsible except where otherwise provided in this working plan. Thus, each agency will finance the construction of its camps, the subsistence of its personnel, and the purchase or rental of its own camp and automotive equipment, although the procurement of these items for the entire project may be assigned to either of the agencies in order to achieve economy in the cost of operation, expeditious handling of supply services, and to avoid the duplication of work in the handling of these services. If it is advantageous to purchase any of these groups of materials under one contract for a National Forest or for the region, this may be done, if mutually agreed, reimbursement being made the purchasing agency for the other's share.

Inasmuch as the number of camps of each agency will fluctuate from year to year, depending upon the status of ownership involved in the work areas, provision should be made for the interchange of equipment in order to avoid the necessity of each agency stocking sufficient equipment for a peak season. Therefore, in emergency cases only, surplus blister rust equipment of each agency will be lent the other in complete camp units, and will ordinarily not be broken into groups of separate items. Separation of ownership will be carefully maintained. At the close of each season's work, loaned equipment will be returned and necessary adjustments made.

2. The procurement of subsistence supplies and the joint use of a supply warehouse, refrigeration facilities, and telephone service, local

and inter-camp, shall be handled on each Forest according to an agreement worked out between the Forest Supervisor and the Bureau technical supervisor before the beginning of each season. The Forest Service will, if possible, furnish office space at the Forest Supervisor's headquarters for the Bureau technical supervisor and his staff.

VI. General:

1. All members of the blister rust control operations of both the Forest Service and the Bureau shall abide by all Forest Service regulations concerning personal conduct on the National Forest. These regulations include restrictions on smoking in the woods, on the speed of trucks, and on other necessary subjects involving the welfare of the general public.

2. The Forest Supervisor will consider the blister rust camp personnel of both Forest Service and Bureau camps as a part of his emergency fire suppression organization and will acquaint the camp foreman with the regulations governing fire duties. During especially hazardous periods, a part or all of the camp personnel may be held over week-ends for emergency fire duty. Blister rust personnel called for fire duty will be returned to their regular duties as soon as they can be replaced, or as soon as the fire is under control.

3. When experienced personnel are available in one agency and lacking in the other, or as may otherwise be administratively desirable, cooperation between the agencies will include mutual helpfulness through such interchange of duties and responsibilities and temporary loan of personnel as may be necessary for effective operation.

Approved:

_____

T. D. Woodbury
Assistant Regional Forester

_____

W. V. Benedict
Senior Forester

TABLE 1

SUMMARY OF 1939 RIBES ERADICATION

State	Initial Eradication Work				Reeradication Work				Totals				Percent Initial Eradication Worked
	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	
		Wild	Cultivated			Wild	Cultivated			Wild	Cultivated		
California	64,276	12,350,567	-	80,375	72,056	4,205,238	-	37,953	136,332	17,055,805	-	118,328	2.94
Oregon	64,265	2,274,471	-	16,095	474	9,113	-	196	64,739	2,283,584	-	16,291	11.88
Total - - - -	128,541	15,125,038	-	96,370	72,530	4,214,351	-	38,149	201,071	19,339,389	-	135,119	4.71

State	Ribes Per Acre		Man Days Per Acre		Number of Camps				Number of Employees					
									Laborers				All Supervision	Total Employees
	Initial Eradication	Re-eradication	Initial Eradication	Re-eradication	CCC	WPA	Regular	Total	CCC	WPA	Regular	Total		
California	200	58	1.26	0.53	17	15	7	39	1,530	1,330	240	3,100	194	3,294
Oregon	35	19	0.25	0.41	-	4	-	4	-	349	-	349	31	380
Total - - -	118	58	0.75	0.53	17	19	7	43	1,530	1,679	240	3,449	225	3,674

TABLE 1A

SUMMARY OF ALL RIBES ERADICATION 1918-1939 (INCLUSIVE)

State	Total Acreage White Pine	Acreage White Pine Worth Protection	Acreage Control Areas (White Pine and Protective Zone)	Acreage Reported Initially Worked	Initial Eradication Work			
					Net Acreage Worked in Control Areas	Number Ribes Destroyed		Number 8-Hour Man Days
						Wild	Cultivated	
California	3,051,568	2,186,662	2,186,662	580,618	580,618	92,289,765	-	401,312
Oregon	444,562	444,562	540,764	199,633	199,633	16,881,311	-	58,164
Total - - - - -	3,496,130	2,631,224	2,727,426	780,251	780,251	109,171,076	-	460,076

State	Reeradication				Totals				Percent Initial Eradication Worked	Per Acre			
	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Net Acreage Worked in Control Areas	Number Ribes Destroyed		Number 8-Hour Man Days		Ribes		Man Days	
		Wild	Cultivated			Wild	Cultivated			Initial Eradication	Re-eradication	Initial Eradication	Re-eradication
California	157,390	12,998,381	-	82,168	738,008	105,288,146	-	484,080	36.55	159	83	0.69	0.52
Oregon	34,379	1,233,734	-	8,552	234,012	18,115,045	-	66,716	36.92	85	36	0.29	0.25
Total - - -	191,769	14,232,115	-	90,720	972,020	123,403,191	-	550,796	28.61	140	74	0.59	0.47

TABLE 2

SUMMARY OF 1938 RIBES ERADICATION BY PROGRAMS
(Including All Work - Initial and Reeradication)

State	Total Acreage Worked (Initial and Reeradication)	Regular and Cooperative				WPA and ERA				ECW and SCS				Totals			
		Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days
			Wild	Cultivated			Wild	Cultivated			Wild	Cultivated			Wild	Cultivated	
California	136,332	31,685	2,211,405	-	10,934	58,998	7,599,030	-	48,931	45,649	7,245,370	-	58,963	136,332	17,055,805	-	118,828
Oregon	64,739	-	-	-	-	64,739	2,283,584	-	16,291	-	-	-	-	64,739	2,283,584	-	16,291
Total - - -	201,071	31,685	2,211,405	-	10,934	123,737	9,882,614	-	65,222	45,649	7,245,370	-	58,963	201,071	19,339,389	-	135,119

TABLE 2A

SUMMARY OF ALL RIBES ERADICATION BY PROGRAMS 1918-1939 INCLUSIVE
(Initial and Reeradication)

State	Total Acreage Reported Worked (Initial and Reeradication)	Regular and Cooperative				WPA and ERA				ECW and SCS				PWA or NRA				Total Emergency Programs (WPA - ECW - PWA)			
		Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man Days
			Wild	Cultivated			Wild	Cultivated			Wild	Cultivated			Wild	Cultivated			Wild	Cultivated	
California	738,008	91,145	4,152,639	-	21,794	334,225	64,298,585	-	265,248	103,484	15,451,571	-	124,159	209,154	21,385,351	-	72,879	646,863	101,135,507	-	462,286
Oregon	234,012	4,781	385,772	-	3,077	197,220	14,813,484	-	54,268	1,145	119,913	-	376	30,866	2,795,876	-	8,995	229,231	17,729,273	-	63,639
Total - - -	972,020	95,926	4,538,411	-	24,871	531,445	79,112,069	-	319,516	104,629	15,571,484	-	124,535	240,020	24,181,227	-	81,874	876,094	118,864,780	-	525,925

TABLE 3

SUMMARY OF ALL OTHER CONTROL WORK FOR 1939

State	Cultivated Black Currant Eradication				Nursery Sanitation						Preeradication Survey		Treatment Infected Trees					Checking					
																		Advance		Post		Regular	
	Number Inspections Made	Number Locations Found	Number Black Currants Destroyed	Number 8-Hour Man Days	Number Nurseries Worked	Number White Pines in Nurseries	Number Acres Worked	Number Ribes Destroyed		Number 8-Hour Man Days	Number Acres Mapped White Pine and Protection Zones	Number 8-Hour Man Days	Number Trees Examined	Number Trees Treated	Number Trees Removed	Number Cankers Removed	Number 8-Hour Man Days	Acreage Checked	Number 8-Hour Man Days	Acreage Checked	Number 8-Hour Man Days	Acreage Checked	Number 8-Hour Man Days
								Wild	Cultivated														
California	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	108,521	1,159 6/8	133,937	2,116 2/8	112,039	2,947
Oregon	-	-	-	-	1	-	254	1,295	-	195	-	-	-	-	-	-	-	64,043	916 6/8	18,277	271 3/8	26,923	679 7/8
Total - - - -	-	-	-	-	1	-	254	1,295	-	195	-	-	-	-	-	-	-	172,564	2,076 4/8	152,214	2,387 5/8	138,962	3,626 7/8

TABLE 3A

SUMMARY OF ALL OTHER CONTROL WORK, 1918-1939 (INCLUSIVE)

State	Cultivated Black Currant Eradication				Nursery Sanitation								Preeradication Survey		Treatment Infected White Pine				
					Number of Nurseries		Number of Acres Worked			Number Ribes Destroyed									
	Number Inspections Made	Number Locations Found	Number Black Currants Destroyed	Number 8-Hour Man Days	Sanitation Zone Maintained	Sanitation Zone Abandoned	Nurseries Maintaining Zones	Nurseries which Abandoned Zones	Total Acreage	Wild	Cultivated	Number 8-Hour Man Days	Number Acres Mapped White Pine and Protection Zones	Number 8-Hour Man Days	Number Trees Examined	Number Trees Treated	Number Trees Removed	Number Cankers Removed	Number 8-Hour Man Days
California	3,298	657	8,621	2,182	1	-	1	-	42	38	-	22	1,088,130	3,400	35,000	-	9	-	221
Oregon	•	1,671	52,202	•	2	-	2	-	1,026••	16,795••	-	419••	348,743	1,847	1,316	-	247	-	252
Total - - -	3,298	2,328	60,823	2,182	3	-	3	-	1,068	16,833	-	441	1,436,873	5,247	36,316	-	256	-	473

• No data available

•• Data incomplete; includes reeradication on Wind River Nursery done in 1939, this nursery is located in the State of Washington.

TABLE 4

SUMMARY EXPENDITURES FOR 1939

State	Total			Recapitulation													
				By Programs (Federal Only)						By Activities (Federal and State)							
					Emergency Program												
	Federal	State - (Includes All Cooperative Funds)	Grand Total	Regular and Cooperative	WPA and ERA	ECW and SCS	PWA	NYA	Total	Supervision Includes State and District Leaders	Ribes Eradication	Cultivated Black Currant Eradication	Nursery Sanitation	Canker Elimination	Pre-eradication Survey	All Other - (Checking, Field Data and Miscellaneous)
California	$628,864.26	-	$628,864.26	$196,865.37	$383,884.47	$48,114.42	-	-	$431,998.89	$71,053.92	$510,983.98	-	-	-	-	$46,826.36
Oregon	111,322.47	-	111,322.47	8,086.19	103,236.28	-	-	-	103,236.28	7,027.76	92,788.13	-	*	-	-	11,506.58
Total - - -	$740,186.73	-	$740,186.73	$204,951.56	$487,120.75	$48,114.42	-	-	$535,235.17	$78,081.68	$603,772.11	-	-	-	-	$58,332.94

* CCC Labor - No costs shown.

TABLE 4A

SUMMARY OF ALL EXPENDITURES, 1918-1939 (INCLUSIVE)

State	Total			Recapitulation												
				By Programs (Federal Only)					By Activities (Federal and State)							
					Emergency Program											
	Federal	State - (Includes All Cooperative Funds)	Grand Total	Regular and Cooperative	WPA, CWA, and ERA	ECW and SCS	PWA	Total Emergency Programs (WPA-ECW-PWA)	Supervision Includes State and District Leaders	Ribes Eradication	Cultivated Black Currant Eradication	Nursery Sanitation	Canker Elimination	Pre-eradication Survey	All Other - (Checking, Field Data and Miscellaneous)
California	$3,441,690.35	-	$3,441,690.35	$1,023,675.40	$1,966,843.58	$54,733.34	$396,438.03	$2,418,014.95	$514,580.78	$2,313,160.53	$39,904.58	$1,315.99	-	$51,158.30	$521,570.17
Oregon	778,593.89	-	778,593.89	245,834.74	443,251.88	-	89,507.27	532,759.15	52,528.88	502,706.33	36,894.79	15,835.51	2,268.00	19,968.27	238,111.55
Total - - -	$4,220,284.24	-	$4,220,284.24	$1,269,510.14	$2,410,095.46	$54,733.34	$485,945.30	$2,950,774.10	$567,109.66	$2,815,866.86	$76,799.37	$17,151.50	$2,268.00	$71,126.57	$759,681.72

* No expenditures prior to 1923, inasmuch as work in California and Oregon was not initiated until that year.

14,839.11

669,762.28

TABLE 4B

STATUS OF BLISTER RUST CONTROL 1916-1939 (INCLUSIVE)

State	Acres			Number 8-Hour Man Days	Number Ribes Destroyed (Wild and Cultivated)	Acres	
	Control Area Including Border Zones	Net Control Area Initially Protected	Control Areas Reworked Subsequent to Initial Protection			Remaining Control Area Needing Initial Protection	Estimated Protected Area Now on Maintenance Basis
California	2,186,662	580,618	*157,390	484,080	105,288,146	1,606,044	195,381
Oregon	540,764	199,633	*34,379	66,716	18,115,045	341,131	102,044
Total	2,727,426	780,251	*191,769	550,796	123,403,191	1,947,175	297,425

* Total acres reeradication.

TABLE 5

SUMMARY OF RIBES ERADICATION WORK ON NATIONAL FOREST LANDS, 1932-1939 INCLUSIVE

Sugar Pine Region	Acreage of National Forest Land in Control Area	Calendar Year	Acreage Covered by Ribes Eradication								Total Acreage Worked by Both Agencies				Accumulative Totals				Total Acreage Worked to Date - First, Second, Third, and Fourth Workings	Unworked Acreage
			Forest Service				Bureau													
			First Working	Second Working	Third Working	Fourth Working	First Working	Second Working	Third Working	Fourth Working	First Working	Second Working	Third Working	Fourth Working	First Working	Second Working	Third Working	Fourth Working		
CALIFORNIA																				
National Forests	998,768	Up to 1932	-	-	-	-	11,318	6,675	-	-	11,318	6,675	-	-	11,318	6,675	-	-	17,993	
		1933	16,343	1,660	4,213	-	-	-	-	-	16,343	1,660	4,213	-	27,661	8,335	4,213	-	40,209	
Eldorado		1934	94,153	1,455	-	-	-	-	-	-	94,153	1,455	-	-	121,814	9,790	4,213	-	135,817	
Klamath		1935	-	-	-	-	30,435	1,135	-	-	30,435	1,135	-	-	152,249	10,925	4,213	-	167,387	
Lassen		1936	-	-	-	-	44,144	9,927	-	19	44,144	9,927	-	19	196,393	20,852	4,213	19	221,477	
Mendocino		1937	8,847	2,480	-	-	5,970	3,508	602	3,952	14,817	5,988	602	3,952	211,210	26,840	4,815	3,971	246,836	
Plumas		1938	10,153	17,175	1,126	745	4,414	1,602	-	-	14,567	18,777	1,126	745	225,777	45,617	5,941	4,716	282,051	
Sequoia		1939	6,118	45,113	1,294	-	16,550	-	-	-	22,668	45,113	1,294	-	248,445	90,730	7,235	4,716	351,126	750,323
Shasta																				
Sierra																				
Stanislaus																				
Tahoe																				
Trinity																				
OREGON																				
National Forests	265,512	Up to 1932	-	-	-	-	2,948	670	-	-	2,948	670	-	-	2,948	670	-	-	3,618	
		1933	-	-	-	-	5,953	129	-	-	5,953	129	-	-	8,901	799	-	-	9,700	
Mt. Hood		1934	480	-	-	-	8,608	1,258	244	-	9,088	1,258	244	-	17,989	2,057	244	-	20,290	
Rogue River		1935	-	-	-	-	10,765	6,465	-	-	10,765	6,465	-	-	28,754	8,522	244	-	37,520	
Siskiyou		1936	42	85	-	-	12,030	-	-	-	12,072	85	-	-	40,826	8,607	244	-	49,677	
Siuslaw -(Mt. Hebo Plantation only)		1937	-	-	-	-	1,231	8,619	-	-	1,231	8,619	-	-	42,057	17,226	244	-	59,527	
		1938	-	-	-	-	16,784	4,817	-	-	16,784	4,817	-	-	58,841	22,043	244	-	81,128	
Umpqua		1939	-	-	-	-	*15,970	-	474	-	*15,970	-	474	-	74,811	22,043	718	-	97,572	190,701

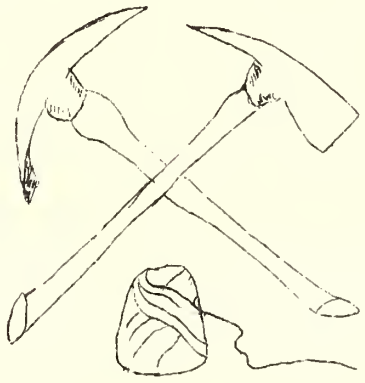
* Includes 5,535 acres of Federal land worked by the State of Oregon WPA project.

PART II

RIBES ERADICATION

By

Roy Blomstrom and Conrad P. Wessela,
Associate Foresters



INTRODUCTION

During 1939, Ribes eradication in California extended along the sugar pine belt of the Sierra Nevada from Lassen Volcanic National Park in the north to Sequoia National Park in the south, and included work on five national forests and four national parks. Three Federal agencies, the Bureau of Entomology and Plant Quarantine, the Forest Service, and the National Park Service, carried on the program through allotments of CCC, ERA, and Forest Service regular funds. The work, with the exception of the program on the Sequoia National Park which was started this year, was a continuation of the projects commenced in previous years.

In Oregon, initial eradication was completed on the Upper Rogue Unit of the Rogue River National Forest, and control work was begun on the extensive sugar pine areas of the Siskiyou National Forest. In addition, a small control unit in southern Washington, established a number of years ago for the protection of white pine stock in the Wind River Nursery and the Northwest Forest and Range Experiment Station Arboretum, was reworked to remove Ribes recurring since the initial working. Prior to July 1 the entire Oregon project was financed by the Bureau of Entomology and Plant Quarantine with ERA funds, but following a curtailment of funds on July 1, the Siskiyou operation was refinanced as a State WPA project under the technical supervision of the Bureau.

The status of Ribes eradication on the 2,727,427 acres of pine lands within the control units of the Sugar Pine Region, as of December 31, 1939, is as follows:

780,251 acres covered initially
177,057 acres covered on second eradication
9,649 acres covered on third eradication
5,063 acres covered on fourth eradication
283,965 acres estimated on maintenance

At the peak of the season approximately 3,450 men, located in 43 camps in California and Oregon, were employed on Ribes eradication work. Seventeen hundred of these men working out of 19 camps were employed and worked in accordance with WPA regulations. The projects were financed through ERA allotments to the Bureau of Entomology and Plant Quarantine, and the U. S. Forest Service, and an Oregon State WPA allotment. An allotment of Forest Service regular funds made it possible to employ 240 men. These men, secured from the local labor markets, were located in seven camps on four national forests. The remaining 1,530 men quartered in 17 camps located on five national forests and four national parks were CCC enrollees. See Table 7 for more specific information on camp size and location by agency.

ORGANIZATION AND ADMINISTRATION

California

The Bureau Operation

Two concessions, a uniform work month of 120 hours and a base pay of $44.00 per month, previously granted to the California Blister Rust Control project by the WPA, were revoked early in the spring of 1939 and regulations making it mandatory to pay prevailing hourly wage rates became effective. Because of the low security wage throughout most of the counties in the sugar pine belt, the regulation requiring payment of prevailing hourly wage rates (45 cents per hour) would have resulted in an 88 hour work month. The operation of a blister rust camp on such a short work month and at such meager monthly earnings was so impracticable that the entire Bureau operation was shifted to that portion of the Sierra National Forest in Fresno County where the security wage rates were sufficiently high to permit a work month of 116 hours at prevailing hourly wages.

The Bureau operation consisted of six large camps located near Shaver Lake. The project was started in late April and was terminated November 1. During the peak of the season 728 men were employed. Headquarters were established in Fresno, California, where a combination field office and warehouse was rented. Two temporary appointees assisted the Bureau operation supervisor on service and supply. In addition to part time assistance extended by the Forest Service blister rust staff man, a unit supervisor was employed by the Bureau to help direct the field work.

Because of the concentration of men in the Shaver Lake Area and the isolation of this area from regular hospital and medical service, it was necessary to establish a field hospital and infirmary on the project. A competent male nurse was placed in charge and during the 5-1/2 month operating

season 1,532 cases were treated, most of them minor. The field hospital not only rendered skilled treatment to minor injuries and illness, but materially reduced the number of cases requiring a doctor's care at Fresno by prompt attention in the field.

The Forest Service Operations

The Forest Service conducted control work on the Lassen, Plumas, Eldorado, Stanislaus, and Sierra National Forests with allotments of ERA, CCC, and Regular funds. During the peak of the season, 1,545 men located in 22 camps were employed.

With the exception of the small job on the Lassen National Forest which was handled by a Bureau technical supervisor in conjunction with his other duties, the project on each national forest was under the direct supervision of the Forest Service blister rust staff man attached to the forest. The details of service and supply, transportation, and fiscal matters, were handled through the regular channels of the Forest Supervisor's office. Forest Service regulations and administrative policies were followed on all projects.

The Forest Service ERA project was confined to the Lassen, Plumas, and Eldorado National Forests, and consisted of nine camps. Three of the camps were 80-man and the remaining six were 45-man units. Four were located on the Eldorado Forest, four on the Plumas, and one on the Lassen. After July 1 the camp on the Lassen was discontinued because of insufficient funds.

Because of the WPA regulations requiring payment of prevailing wages, the Forest Service, like the Bureau, faced the problem of camp operation on an 88-hour work month. However, the Forest Service was able to operate in the low security wage counties by supplementing its ERA money with regular funds. In this way ERA employees were able to work 130 hours per month: 88 hours paid from ERA funds, and 42 hours from regular funds at the same hourly rate received on the ERA pay roll. This plan was kept in effect until July 1.

Camp organization in the Bureau and Forest Service camps varied only with the amount and the type of funds used in financing the camps. In the ERA camps, one appointed camp boss was employed and from two to six assistants were selected from the camp personnel to assist with the field work. The kitchen and mess were under the supervision of an appointed cook, with the required number of assistants selected from the camp personnel. With the exception of the camp boss and cook all other camp personnel were employed and worked in accordance with WPA regulations.

During the season both the Forest Service and Bureau ERA camps operated on two different work schedules and three different pay schedules. At the beginning of the season prevailing wages were paid on all projects. However, on July 1, a 130-hour work month became effective with the same base pay, thus lowering the hourly rate. Again on September 1 the pay rate was slightly increased, but the hours of work per month remained at 130. Board deductions remained constant at $20.00 per month throughout the season.

The following tabulation gives the gross monthly earnings for the security wage job classifications used in ERA camps.

Period	Unskilled		Semi-Skilled		Skilled		Professional	
	Bureau	Forest Service	Bureau	Forest Service	Bureau	Forest Service	Bureau	Forest Service
To June 30*	$52.20	$39.60	$60.32	$44.88	$75.40	$54.56	$83.52	$60.72
July 1 to August 31	52.00	40.30	59.80	45.50	75.40	54.60	83.20	61.10
September 1	52.00	49.40	62.40	59.80	81.90	76.70	84.50	78.00

* Until June 30 the men in the Forest Service camps worked an additional 42 hours at 45 cents per hour, paid from regular funds.

All labor assignments were made through the State WPA office in San Francisco. Requisitions for men were promptly filled at the beginning of the season, but from the first of August to the termination of the work in the fall, considerable trouble was experienced in securing men. The inexperienced men were of the same low caliber as those secured in previous years. Labor turnover was high; on the Bureau operation alone it was necessary to make 1,451 assignments to maintain an average camp strength of 600 men.

The Forest Service CCC blister rust project consisted of 695 enrollees from eight camps located on the Lassen, Plumas, Eldorado, Stanislaus, and Sierra National Forests. The work in each camp was under the supervision of the camp superintendent, or, in spike camps and camps where the entire personnel was not assigned to blister rust control, under the supervision of the senior foreman. Whenever practicable, the regular CCC personnel attached to the camps were assigned as blister rust foremen.

Prior to July 1, the Forest Service regular camp program consisted of two 33-man camps on the Stanislaus Forest. However, five additional 33-man camps were established July 1, two of which were located on the Sierra, one on the Eldorado, and two on the Plumas National Forests. All camps were doing second eradication on areas worked initially in 1934, 1935, and 1936.

The Forest Service regular fund camps were 33-man units. The appointed personnel consisted of one camp boss, one strawboss, and one cook. From 9 to 12 men were classed as crew leaders, and the remaining men were laborers. Men in regular camps worked 44 hours per week, but as four hours on Saturday constituted a full day, the men received pay for 48 hours. In addition, they were entitled to 2½ days' annual leave with pay per month. The pay for crew leaders was 55 cents per hour, and for laborers 45 cents per hour; board deductions were 75 cents per day.

The labor secured in the Forest Service regular camps was superior to either ERA or CCC labor, but because most of the camps did not open

until July, the better class of labor was already employed, and therefore, was not available. A number of college students were employed and in most cases proved very satisfactory.

The National Park Service Operation

The National Park Service conducted blister rust control work on the Lassen Volcanic, Yosemite, General Grant, and Sequoia National Parks. Such work, in all cases, was performed by the CCC. At one time during the season, 835 enrollees working out of nine camps were engaged on Ribes eradication. The first camp to open was at Wawona in Yosemite Park. This camp began operation on April 15 and continued until the early part of November. The remaining Park camps did not start work until the latter part of May and terminated work in October.

The work on each Park was administered by a representative of the Park Service, assisted by a technical supervisor of the Bureau of Entomology and Plant Quarantine. On the Lassen Volcanic Park, Eugene J. Barton, Chief Ranger, was in charge. The work on Yosemite Park was under the general supervision of Emil F. Ernst, Park Forester. General Grant and Sequoia National Parks projects were under the direction of Marshall Elvin, Senior Foreman in Forestry, and Edwin Boothe, CCC Coordinator, respectively.

To insure a nucleus of experienced blister rust foremen, the Park Service added eight experienced foremen to their permanent CCC staff.

Two Bureau eradication staff men were assigned to the Park projects, and they were responsible for the technical phases of the work, interpretation of checking data, and establishing Ribes eradication standards.

Oregon

Until the end of the fiscal year of June 30, 1939, the entire Oregon program was administered and financed by the Bureau of Entomology and Plant Quarantine in accordance with WPA regulations through an allotment of Emergency funds. Because of reduced ERA allotments it became necessary for the Bureau to terminate the operation on the Siskiyou Unit on July 1. However, the Work Projects Administration of Oregon took over this project on July 10 under Bureau sponsorship and completed the work outlined for the 1939 season under the technical direction of the Bureau's permanent personnel. Eradication on the Upper Rogue River Unit was continued after July 1 as a Federal agency project of the Bureau.

Technical direction and general supervision of operations were achieved by an operation supervisor, an assistant, and a checking supervisor, all permanent employees of the Bureau. A camp foreman was in charge of each camp assisted by a supervisory cook, a clerk, and strawbosses. Camp foremen, and supervisory cooks, were employed under temporary appointment. The remainder of the personnel was obtained from the relief rolls of southern Oregon counties. Considerable difficulty was encountered after July 1 in securing sufficient qualified reliefers to maintain the Rogue River project at the necessary employment level.

The Rogue River project was composed of three camps, one 100-man road camp, one 30-man road camp, and one 30-man trail camp. The two small, portable camps were moved several times during the season in order to finish odds and ends of initial work remaining about the unit. In August, they were combined and moved to the Klamath National Forest.

Work on the Klamath consisted of developing a camp site for a large number of men and in preparing for future eradication activities.

The area covered on the Siskiyou Unit was located sufficiently close to Grants Pass, Oregon, and other nearby communities to enable the laborers to be driven to and from their homes daily. In this manner as many as 170 men were transported each day. Laborers were divided into approximately 25-man units, each under the direction of a trained strawboss. These units, each comprising a truck load of men, were dispatched by appointed foremen to the place of work each morning. Technical direction and supervision of the project was accomplished by a unit supervisor and two foremen. The organization operated satisfactorily and obviated the necessity of camps.

LOCATION AND DESCRIPTION OF AREAS

California

Several important factors determined the selection of the 1939 eradication areas, namely: (1) the need for reeradication; (2) the use of CCC camps which were already established; and (3) the necessity of locating Bureau ERA camps in Fresno County, in order to secure a maximum work month and a net monthly wage high enough to induce ERA workers to accept employment on the project. On the accompanying map of each national forest and national park, the areas worked prior to 1939, areas covered initially and on reeradication during 1939, and areas remaining to be worked are depicted in color.

Work this season, with the exception of that performed on the Sierra National Forest and the Sequoia National Park, was conducted on areas in the vicinity of prior work. A description of these areas is discussed in previous annual reports.

Sierra National Forest

Initial eradication was started on the Shaver Lake-Dinkey Creek Unit between the San Joaquin River on the north and the Kings River on the south. Work was performed on the two ends of this unit leaving the unworked portion in one body in the center. The topography is extremely rough. The timber on about 20 percent of the acreage worked has been logged, but most of the cut-over lands now support a good stocking of sugar pine reproduction. A good stand of mature sugar pine in association with white fir covered the remainder of the worked area. In the virgin timber areas Ribes nevadense was abundant along the streams and Ribes roezli light in the uplands. The cut-over lands supported a heavy concentration of both Ribes species, principally R. roezli, closely associated with Ceanothus cordulatus and on local areas extremely large R. roezli bushes formed dense patches, which

proved to be particularly difficult to eradicate. Except for a few sections on lower Dinkey Creek the unit was readily accessible by roads.

Sequoia National Park

Approximately 100 enrollees from the Marble Fork CCC Camp were assigned to Ribes eradication on the Sequoia National Park this season. The area worked lies between the Marble and Middle Forks of the Kaweah River about four miles from the Giant Forest. The topography adjacent to the Giant Forest is moderate but the Marble Fork of the Kaweah presents a difficult job of Ribes eradication due to the precipitous character of the stream canyon. Work along the canyon walls in this region was made possible by equipping each crew with special rope harness to permit the workers to be lowered over the rocky walls.

In approximately 2,700 acres of the best sugar pine type in Sequoia grows R. tularense, a trailing multiple-rooted bush which presents a special eradication problem. As this is the first time this Ribes species has been encountered in control work, experiments were undertaken to determine the most satisfactory tools to use to eradicate these trailing Ribes. The most effective tool developed this season is one with a pick on one end and a flat claw on the other.

Oregon

The accompanying maps show the location in detail of the areas on each National Forest upon which control work was done during the 1939 season, the area worked prior to 1939, and the area remaining to be worked. The work on the Rogue River National Forest was a continuation of former work and a description of the areas will be found in earlier reports.

Siskiyou National Forest

The greater part of Ribes eradication on the Siskiyou Unit was done in the foothill country west and southwest of Grants Pass, Oregon, and adjacent to the eastern boundary of the forest. Of the 54,615 acres covered, 11.6 percent is national forest land, 54.6 percent is privately owned, 33.3 percent is administered by the U. S. Department of the Interior through the Oregon and California Revested Land Grant Administration, and 0.5 percent is owned by the State of Oregon.

Approximately one half the acreage covered had been cut-over from 20 to 60 years ago. Young sugar pine trees ranging in size from seedlings to poles are numerous and generally distributed over this unit. Moreover, sufficient low-value, mature, sugar pine trees were left after logging to assure a seed supply for future reproduction. Uncut areas carry sugar pine of all age classes associated principally with Douglas fir and some ponderosa pine.

With few exceptions, Ribes were light and scattered. Some stream type contained an abundance of R. klamathense, and in the vicinity of Mooney Mountain occasional patches of R. cruentum were present. However, 66 percent of the total area covered was found to be Ribes free and an average of only 35 Ribes per acre was removed from the lands worked by eradication crews.

METHODS OF WORK

California

Mechanical eradication on upland Ribes was tried in California for the first time this summer, and from limited tests appears to be effective on areas supporting heavy concentrations of large bushes. A D-2 Diesel caterpillar tractor with a single drum winch and a special plow grapple was used in the tests.

The "claw-hammer" type Ribes eradication tool developed and tried at intervals since 1926 was improved by the Methods Unit this season and gave good results on small to medium sized bushes growing in relatively loose soil. On large bushes or in hard packed or rocky soil the customary pick mattock proved more effective. The claw-hammer type tool probably will not entirely supplant the standard pick mattock, but will be useful as a supplementary tool. Similar tools were tried on the Oregon operation with comparable results.

On the Plumas Forest and Sequoia Park it was often necessary to resort to ropes in lowering men over cliffs to remove Ribes. Several hitches proved satisfactory. All of them gave the eradication man free use of both arms and were so constructed that should the man lose his footing or balance he could not fall from the sling.

Blasting large bushes with stumping powder was used to a limited extent again this year. The method is effective in local areas.

A detailed description of these auxiliary methods will be found in the Methods Report.

Standard Ribes eradication practices, modified to meet existing conditions, were used throughout the Sugar Pine Region. On the majority of the operations this year, from 25 to 35 CCC enrollees were placed under one foreman, and then divided into 4- or 5-man crews working abreast as a unit. String lines were run in advance. The leaders and assistant leaders followed the crews and the foreman supervised the entire contingent. While there are many disadvantages to this system, such as lack of uniform speed among the crews and inflexibility, the advantages (when using CCC enrollees) of improved supervision, resulting in less rework and better initial coverage, more than compensate for the disadvantages.

Oregon

Standard hand eradication methods with a three-man crew equipped with a pick mattock were employed on all Oregon operations wherever possible. To a small extent dry chemical was applied to the cut crowns of Ribes exceedingly difficult to uproot. This supplemented and accelerated standard digging methods on the Siskiyou and Wind River projects. In some instances, the size of crews was varied because of physical characteristics of laborers. lack of suitable crew leaders, or because of the type of terrain and the distribution of Ribes.

An experiment with a tractor and a grapple in eradicating Ribes cereum is worthy of comment. In the 1938 annual report there appears an account of the eradication of R. cereum with a specially constructed grapple or plow drawn by a team of horses. This season a tractor, obtained from the Forest Service, was substituted for the team to determine which method would be more economical and efficient. Using the tractor, 11,539 bushes were uprooted in nine 8-hour days. On the basis of a tractor rental charge of $8.00 per day and an operating cost of $1.47 per day for gasoline and oil, the per bush cost was 2.3 cents. Each method required the same number of men. Since the cost per uprooted bush using a team of horses was 1.8 cents, this method appears to be the more economical under conditions prevailing in the pumice soils of southern Oregon. Efficiency of eradication work appeared to be about equal, although, on the whole, a team of horses proved more mobile and practical.

RESULTS

The results of the work are shown in tabular form for each agency and type of fund in Tables 1 to 6.

California

Reeradication formed a large part of the eradication work in California during 1939. Reeradication was performed on four national forests and one national park representing a composite of the working conditions, types, and Ribes concentrations found throughout the State.

A comparison of the second eradication performed this year with the initial performed on the same area in 1934-1935 shows decided progress in the control objectives of permanent Ribes suppression. On the initial eradication 63,722 acres required crew work and 16,240 acres blocked out as Ribes free. This year on second eradication on the same area 54,922 acres required crew work and 25,220 acres blocked out as Ribes free, a 14 percent decrease in the amount of area requiring crew work and a 35 percent increase in the Ribes free area.

Second eradication revealed a decided decline in Ribes per acre. Originally 9,412,054 bushes or 148 Ribes to the worked acre were removed. On second eradication this was reduced to 2,701,693 bushes or 49 Ribes to the worked acre.

The bulk of the initial eradication was performed in 1934 with regular labor. In 1939 the reeradication was done with a combination of CCC, ERA, and regular labor, yet the number of man days decreased from 37,797 on initial eradication to 25,970 on second eradication, a reduction of 31 percent.

Twenty-four hundred acres or 15 percent of the initial 16,000 acres that blocked out as Ribes-free on initial eradication did not meet the efficiency standards this year and required crew work. The more rigid efficiency standards and the more thorough check in 1939 account for the rework of the 1934 block out area.

There were certain uncontrollable factors which had a decided influence on results and total accomplishments. The two most important were the time lost through fire fighting and the disruption of field programs because of delays in receiving allocations of new funds and modifications in the WPA regulations.

An acute forest fire condition lasting from the middle of July until the middle of September interrupted eradication work almost continuously for this period as blister rust crews were called for fire suppression duty. The camps on the Plumas suffered the most lost time though. The Deer Creek CCC camp, on the Lassen Forest, during August worked on Ribes eradication only three days and on only one of these days was the entire crew available. Throughout the season approximately 27,000 man days were lost to blister rust control work because of fire.

The delay in receiving allocation of new funds July 1 forced both the Bureau and the Forest Service ERA camps to suspend operations. The Bureau camps were kept manned in a nonwork status until new funds came through on July 7. The Forest Service, however, did not receive new allotments until the last part of July which necessitated the release of all workers and their later reassignment to the project. This unfortunate break in the middle of the season caused a great deal of lost time, wasted motion, and unnecessary expense, and resulted in incomplete coverage of several camp areas.

Ribes-to-Pine Spread Plots, Shasta National Forest

During 1939 the Ribes-to-pine spread plot of the Division of Forest Pathology located at Deadhorse Ridge, Section 6, T. 39 N. R. 2 E., and section 31, T. 40 N., R. 2 E., on the Shasta National Forest was eradicated of Ribes by labor furnished and supervised by the Bureau. The Forest Service provided quarters for the men at the Bartle Guard Station on the Shasta Forest. The results of the work are recorded below:

Worked Acres	Eight-Hour Man Days Expended	Ribes Eradicated
227	158	6,056

Ribes Eradication at D. L. Bliss State Park

The D. L. Bliss State Park and the quarter mile protection strip around the Park comprise an area of approximately 2,000 acres adjacent to Emerald Bay on Lake Tahoe. The area supports a moderate number of scattered mature sugar pine trees of high aesthetic and recreational value.

Eradication work which was started August 1 and terminated September 30 was performed by ten CCC enrollees from the camp located on the Park under the supervision of a Bureau employee. Work was confined to the northwest quarter of Section 9, T. 13 N., R. 17 E., and 20 acres of stream type in the southwest quarter of the same section. The worked areas were exceedingly steep and brushy, and the numerous streams and alder swamps

supported a heavy concentration of R. nevadense and R. inerme. The upland type supported scattering R. roezli and R. viscosissimum. A summary of the work is recorded below:

Worked Acres	Eight-Hour Man Days Expended	Ribes Eradicated
180	325	29,065

Oregon

All the area on the Upper Rogue Unit outlined for control work has been covered initially, although 2,640 acres covered the latter part of the season do not meet standards of control. A clean-up job in the near future is needed.

On the Siskiyou project every effort was made to put all area supporting light Ribes growth on a maintenance basis. Since bushes were large and seedlings absent, at least 50 percent of the worked area should go on maintenance as a result of one working. The light and scattered Ribes growth with large blocks of Ribes-free area encountered on the Siskiyou Unit seems to be characteristic of sugar pine type worked to date in southern Oregon. The same condition existed on the Pinehurst and Prospect areas of the Rogue River National Forest. Control costs are low and a maintenance condition is quickly reached.

Wind River Nursery Reeradication Project

For the protection of the five-needled pine arboretum and the nursery at the Wind River Branch of the Northwest Forest and Range Experiment Station, a small control unit of 1,440 acres was established a number of years ago. This unit is located within the Columbia National Forest near Carson, Washington. Initial Ribes eradication was completed in 1931, and from that time until 1939 no follow-up or maintenance work had been done. When new infection was noticeable in the arboretum, officials of the Experiment Station requested an examination of the area to determine the amount of work needed to reestablish control. Accordingly, a post check of the original unit was made in June by members of the Bureau's Oregon checking organization, and as a result of this survey reeradication work was started in the summer.

The Northwest Forest and Range Experiment Station assigned 12 CCC enrollees to the eradication project to work under the direction of one trained blister rust foreman detailed to the job by the Bureau. This crew was later reduced to six enrollees because of a critical fire situation in the vicinity of the project.

Checking data obtained after the reeradication work was completed indicate that the entire control unit now meets rigid control standards. Furthermore, operations during 1939 revealed that of the 1,440 acres in control unit, 1,186 acres are on a maintenance basis as the result of two workings, and that an average of but 5 Ribes per acre were removed from the 254 acres supporting Ribes growth. However, every Ribes bracteosum bush

and about nine tenths of the R. sanguineum bushes removed were infected with blister rust. All small, native white pines examined during the progress of the Ribes eradication job had fruiting cankers. Because of the large amount of local infection, new pine infections will undoubtedly appear during the next two to four years. Pines in the arboretum should, therefore, be examined periodically, and any cankers discovered should be promptly removed. Another thorough post check should be made two years hence to measure the extent of Ribes regeneration and to plan any rework that may be necessary before additional new infection can develop.

From the standpoint of blister rust damage the reeradication program performed in 1939 should have been done several years earlier, and because of the volume of rust present on native pines in the immediate vicinity of the arboretum and nursery, the need of a second post check within two years cannot be emphasized too strongly. The results of the work appear in the following tabulation:

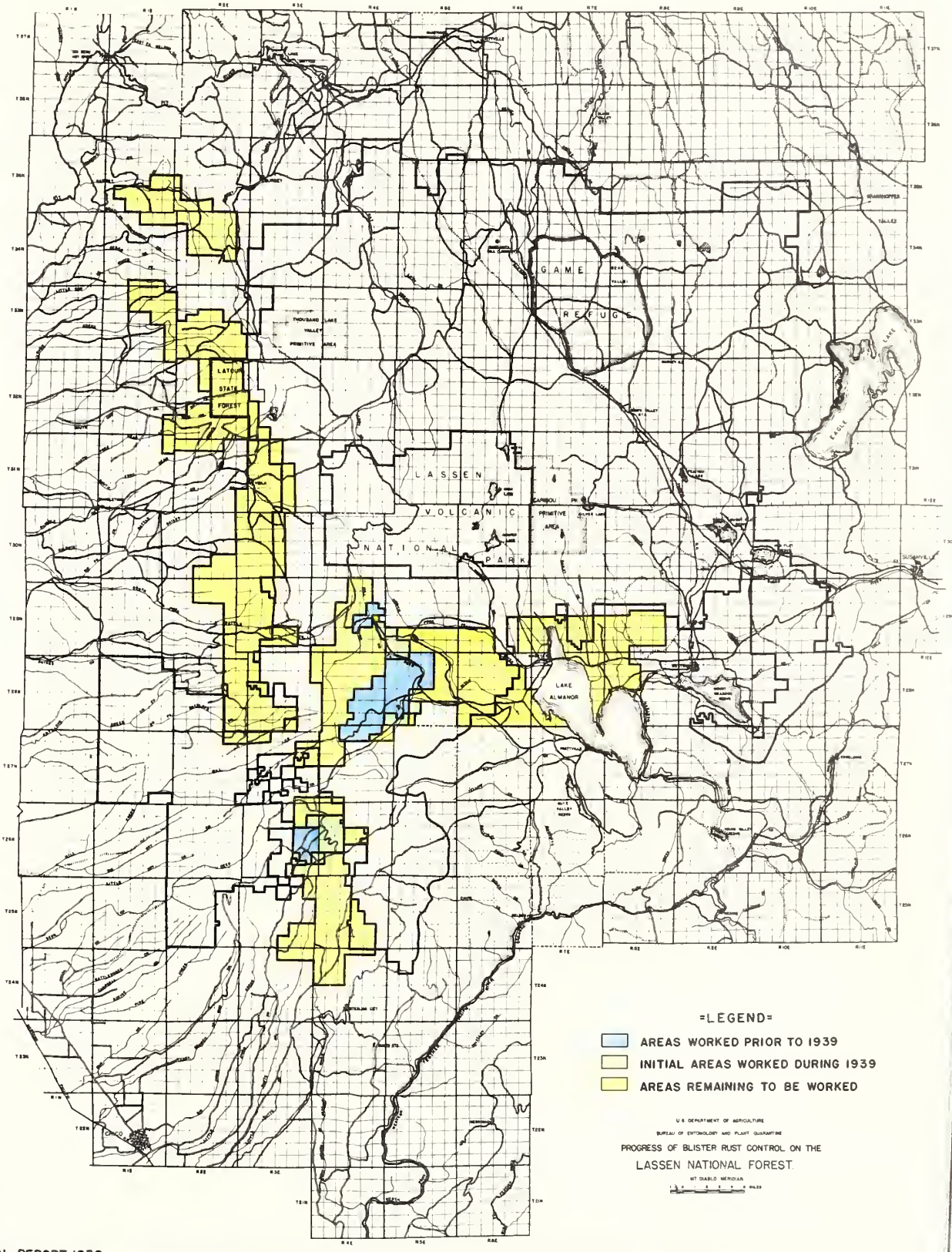
Worked Acres	Eight-Hour Man Days Expended	Ribes Eradicated
254	195	1,295

Explanation of Tables

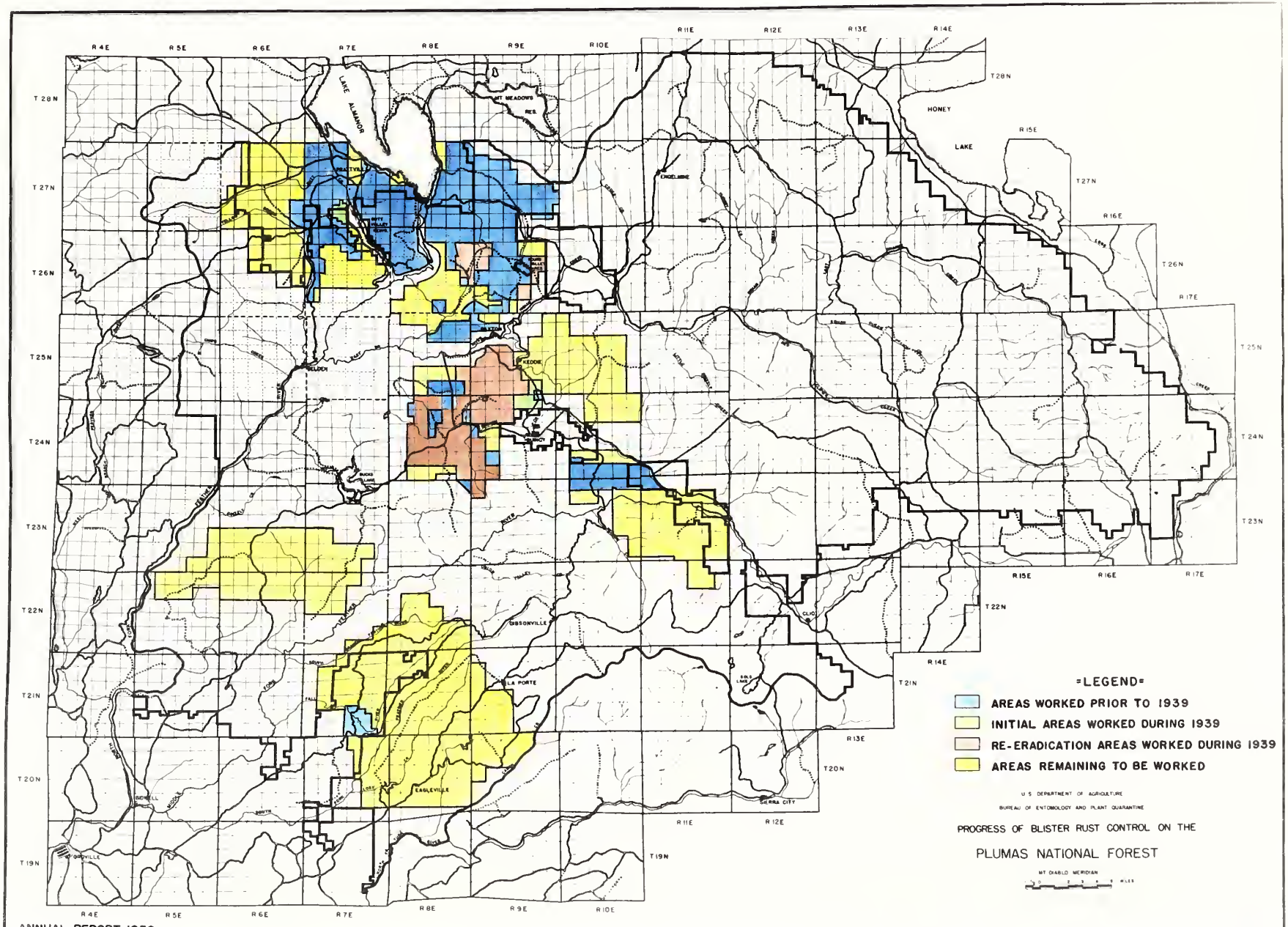
Eradication Tables: Table 1 is an accumulative record of Ribes eradication since the inception of the work. Tables 2 to 6 present the results of Ribes eradication during 1939 and Table 7 shows the distribution of camps by agency and type of funds.

Cost Tables: The expenditures for the calendar year 1939 are shown in Tables 8, 9, and 10. Table 8 shows the total expenditures for the Sugar Pine Region by agency and type of fund. Classified Bureau expenditures by appropriations and projects are shown in Table 9. Table 10 is a cost statement for Bureau expenditures directly chargeable to eradication.

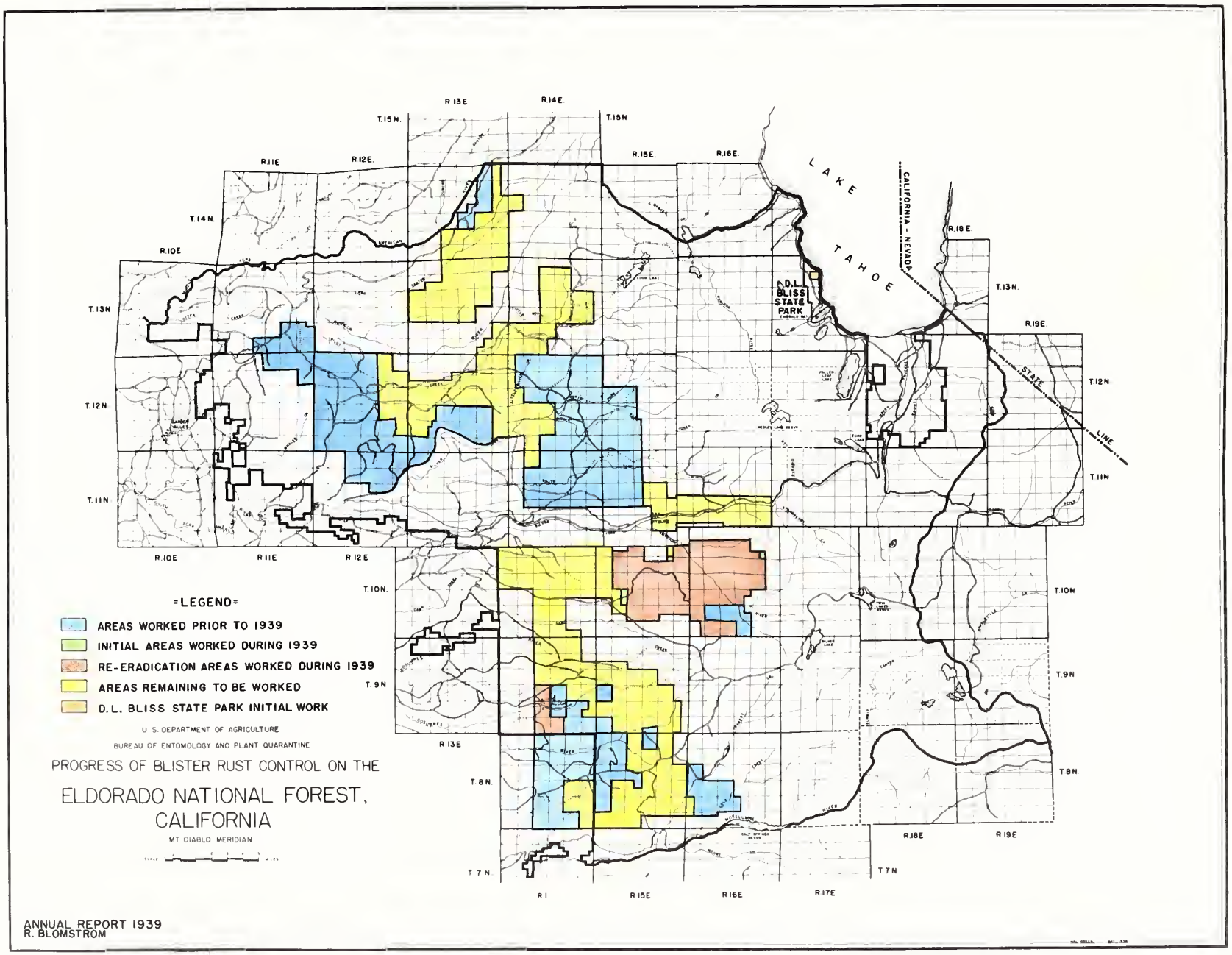
No adjusted statement was prepared this year for Forest Service expenditures as an accurate breakdown could not be secured without undue expense inasmuch as the Forest Service general accounting system was in process of revision.



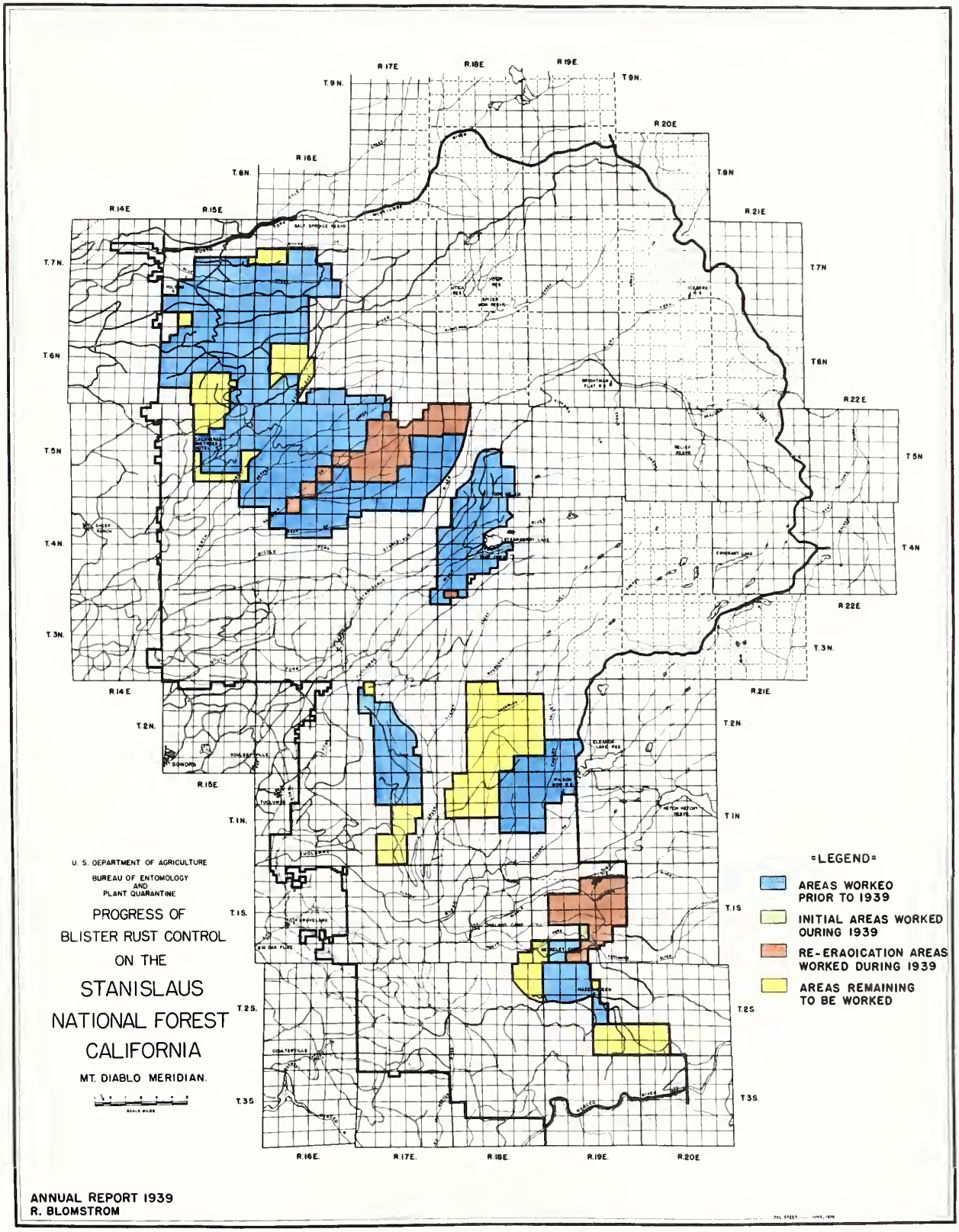
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BENTON HOWARD

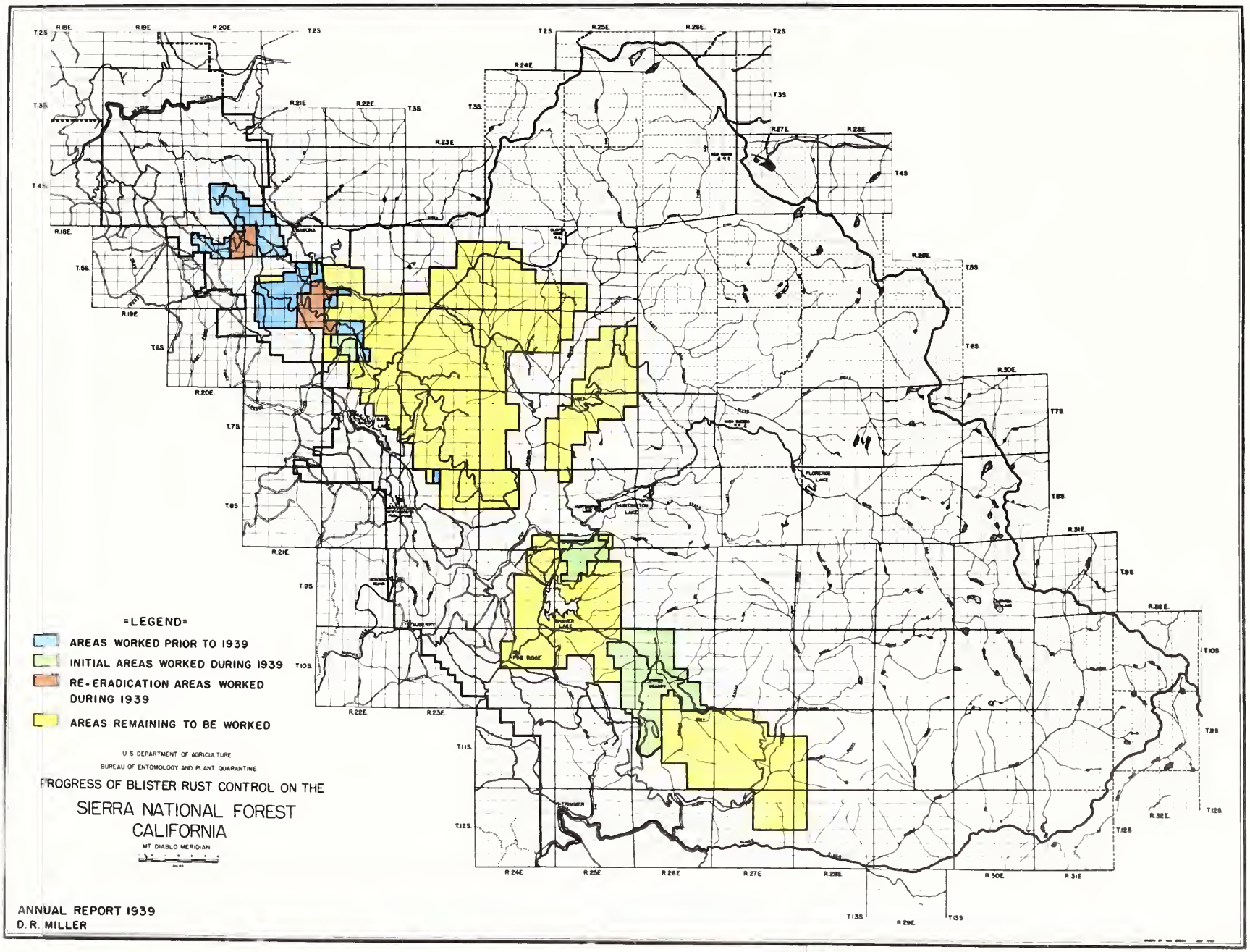


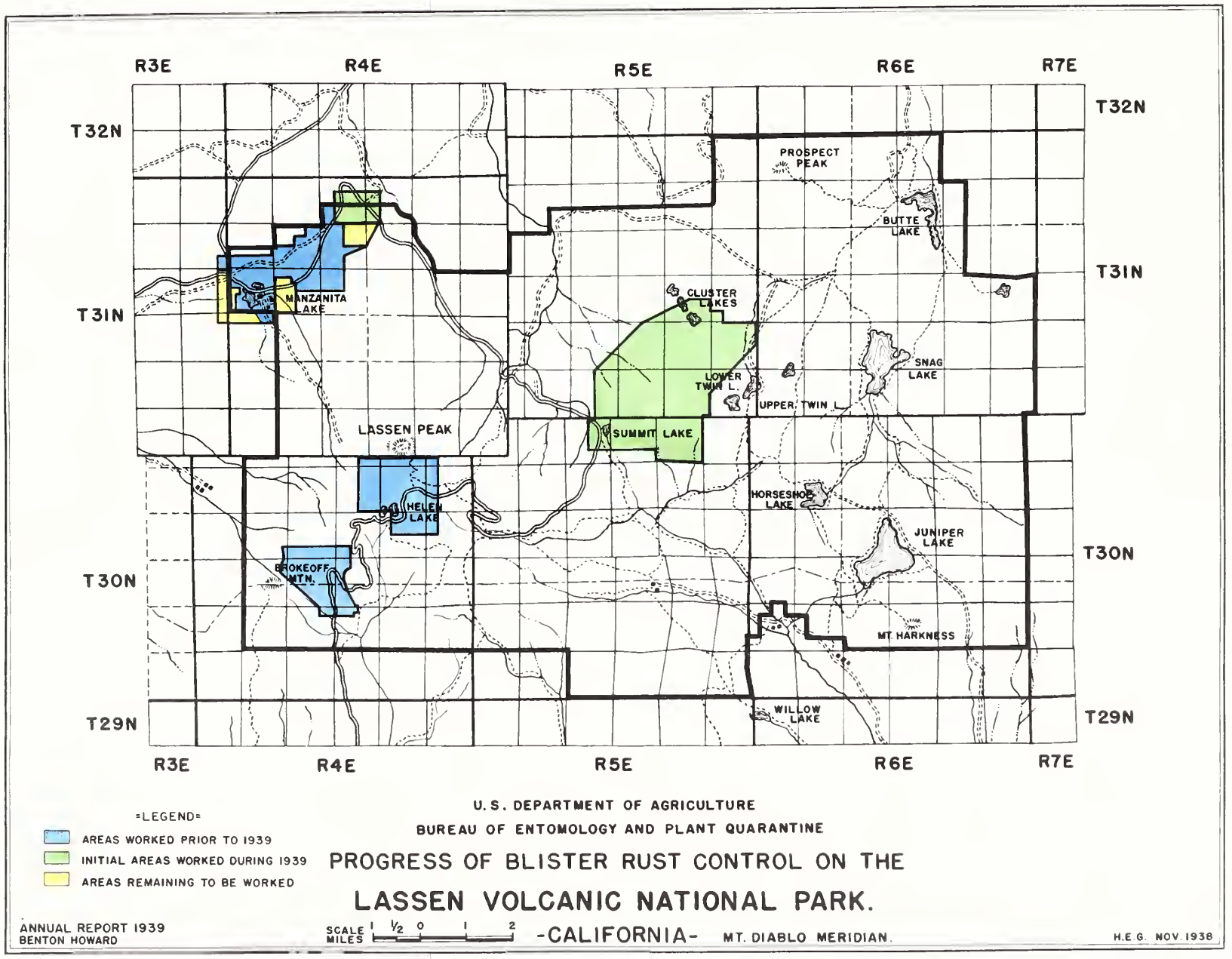
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R. BLOMSTROM


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U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY
AND
PLANT QUARANTINE
PROGRESS OF
BLISTER RUST CONTROL
ON THE
STANISLAUS
NATIONAL FOREST
CALIFORNIA
MT. DIABLO MERIDIAN.
=LEGEND=
AREAS WORKED PRIOR TO 1939
INITIAL AREAS WORKED DURING 1939
RE-ERADICATION AREAS WORKED DURING 1939
AREAS REMAINING TO BE WORKED
ANNUAL REPORT 1939
R. BLOMSTROM


=LEGEND=
AREAS WORKED PRIOR TO 1939
INITIAL AREAS WORKED DURING 1939
RE-ERADICATION AREAS WORKED DURING 1939
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U S DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
SIERRA NATIONAL FOREST
CALIFORNIA
MT DIABLO MERIDIAN
ANNUAL REPORT 1939
D. R. MILLER



U. S. DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

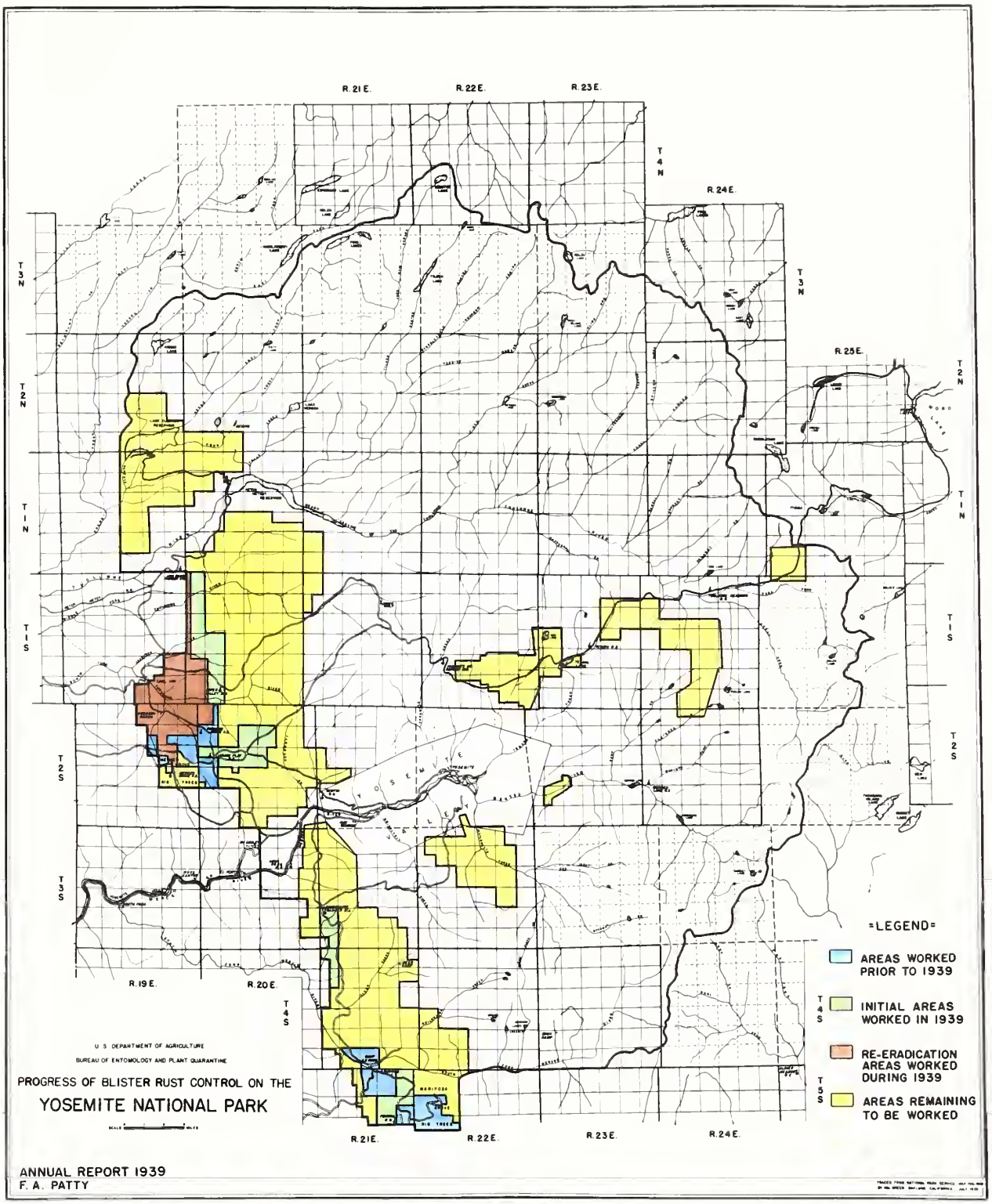
PROGRESS OF BLISTER RUST CONTROL ON THE

LASSEN VOLCANIC NATIONAL PARK.

-CALIFORNIA- MT. DIABLO MERIDIAN.

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BENTON HOWARD

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AREAS WORKED PRIOR TO 1939
INITIAL AREAS WORKED IN 1939
RE-ERADICATION AREAS WORKED DURING 1939
AREAS REMAINING TO BE WORKED
U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
YOSEMITE NATIONAL PARK
ANNUAL REPORT 1939
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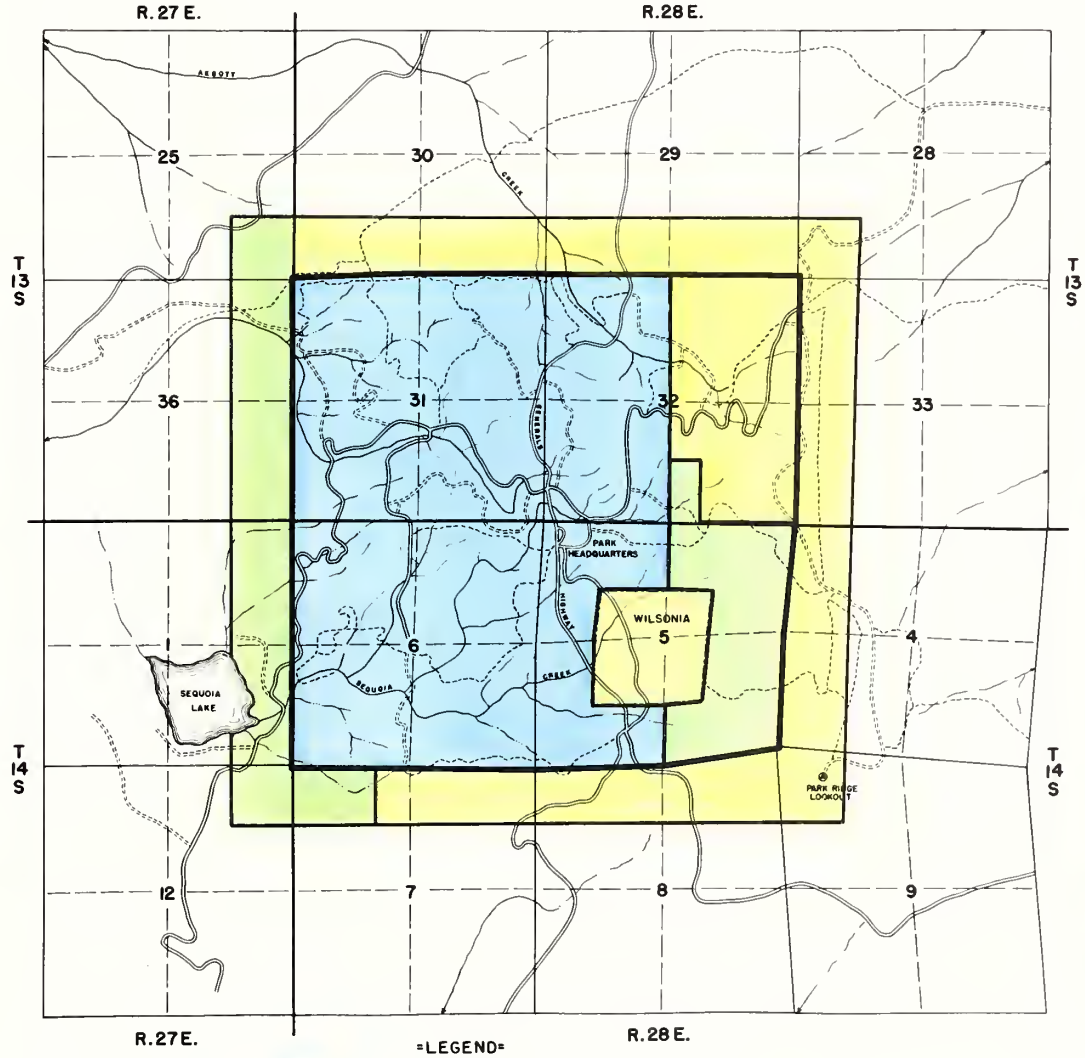
U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

PROGRESS OF BLISTER RUST CONTROL ON THE

GENERAL GRANT NATIONAL PARK

MT. DIABLO MERIDIAN

0 ½ 1
SCALE OF MILES

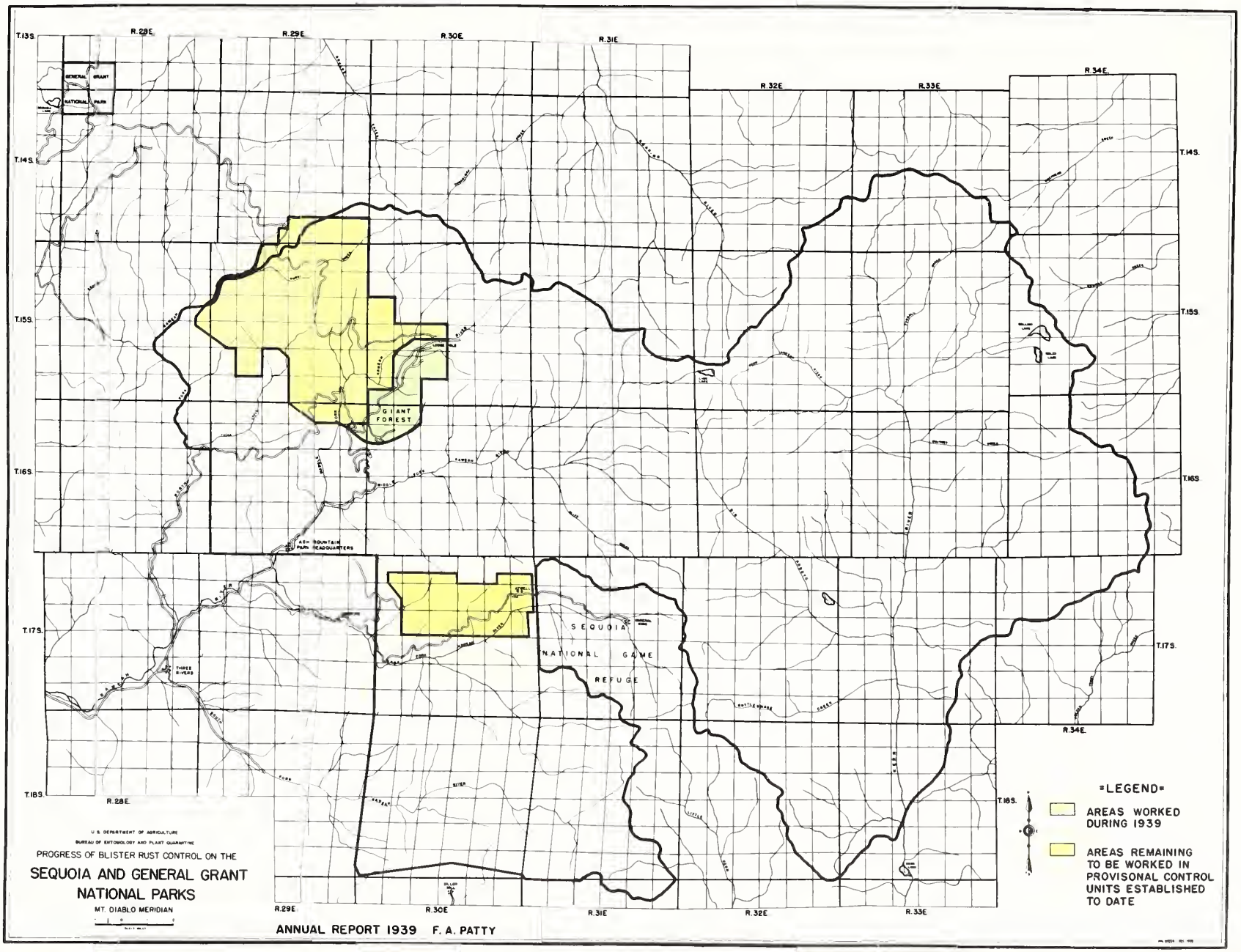


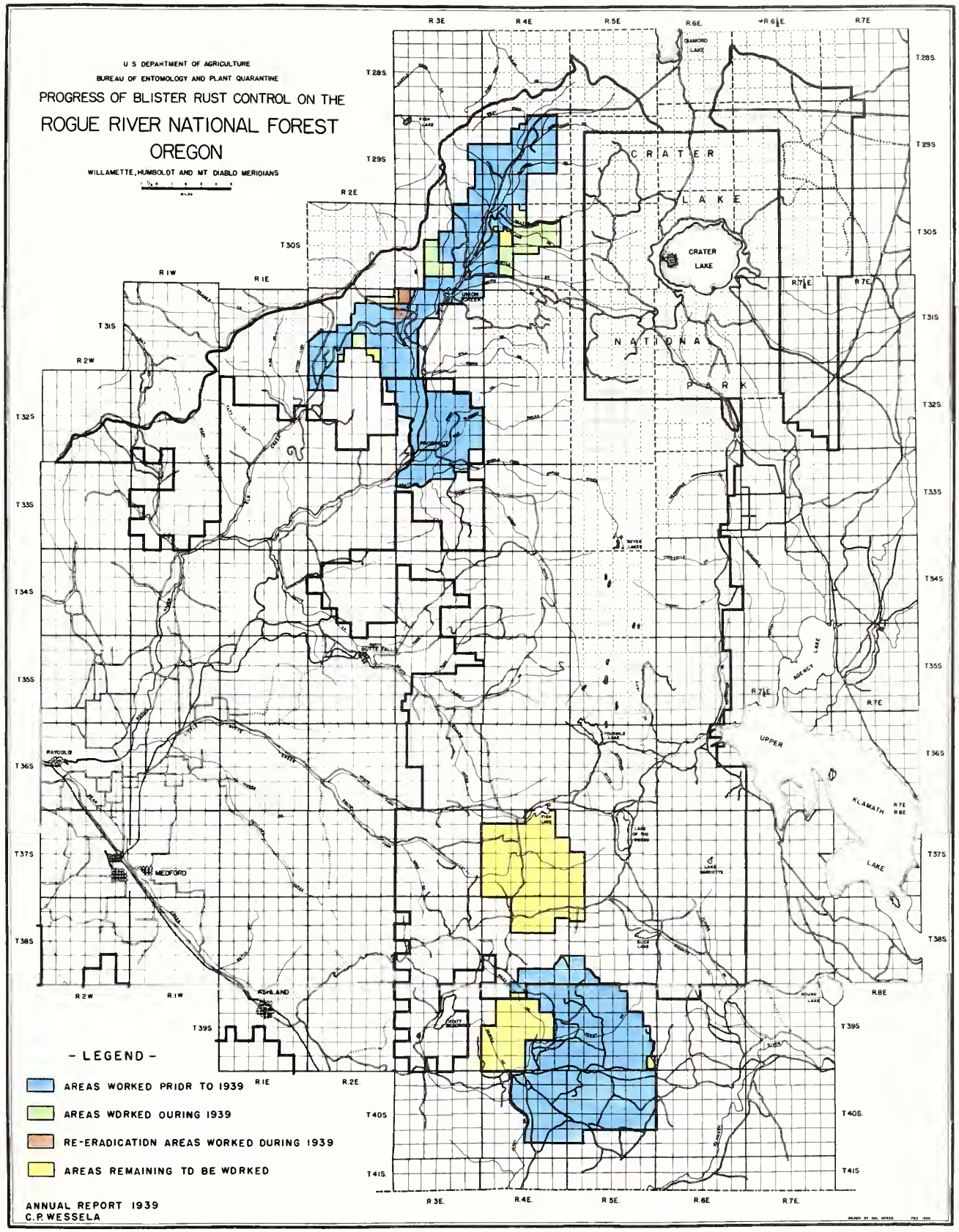
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- AREAS WORKED PRIOR TO 1939
- INITIAL AREAS WORKED DURING 1939
- AREAS REMAINING TO BE WORKED

ANNUAL REPORT 1939
F. A. PATTY

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R.31E.
R.32E.
R.33E.
R.34E.
GENERAL GRANT NATIONAL PARK
GIANT FOREST
ASH MOUNTAIN MAIN HEADQUARTERS
THREE RIVERS
SEQUOIA NATIONAL GAME REFUGE
U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
SEQUOIA AND GENERAL GRANT NATIONAL PARKS
MT. DIABLO MERIDIAN
ANNUAL REPORT 1939 F. A. PATTY
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AREAS WORKED DURING 1939
AREAS REMAINING TO BE WORKED IN PROVISIONAL CONTROL UNITS ESTABLISHED TO DATE

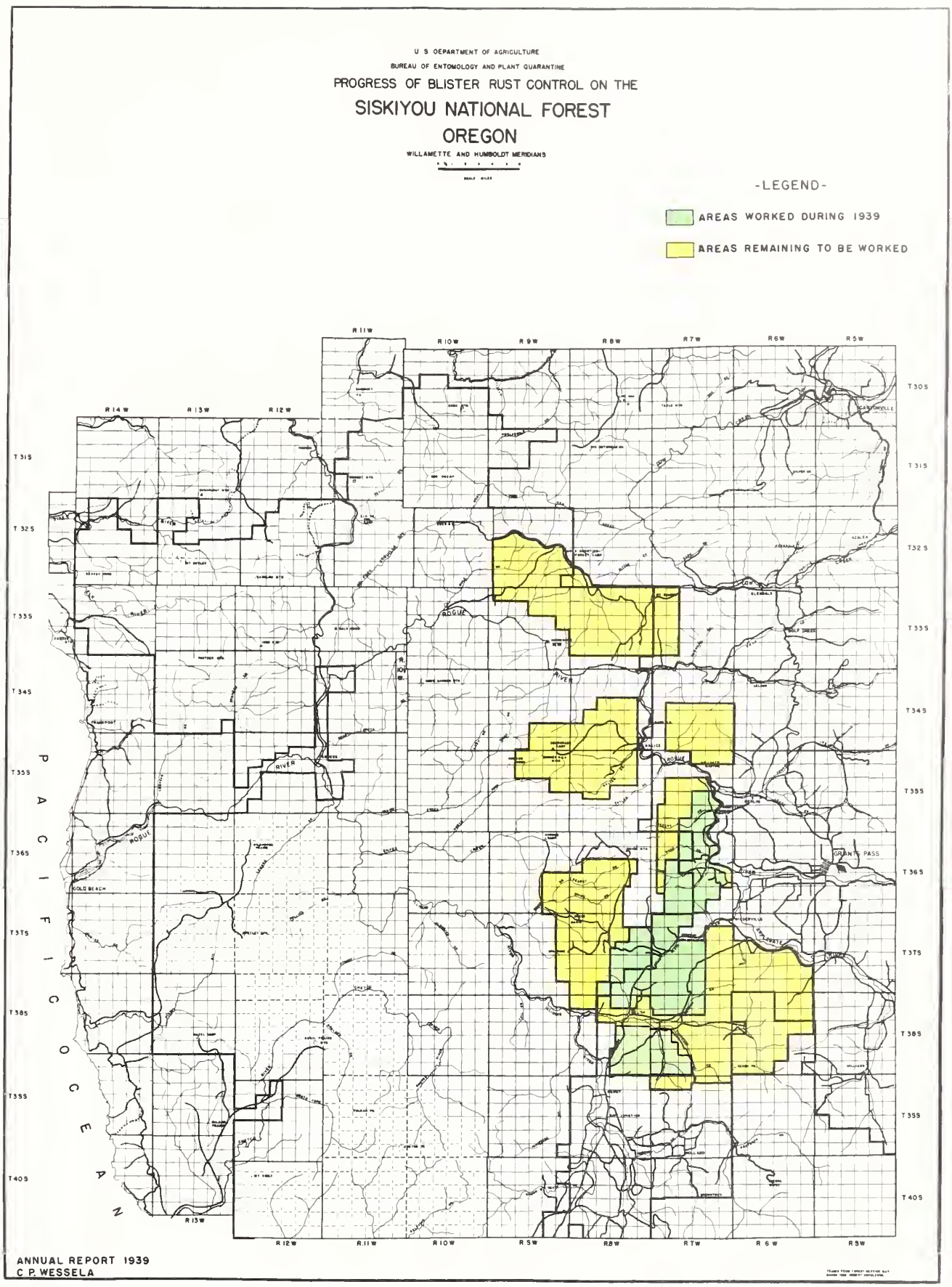

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BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
ROGUE RIVER NATIONAL FOREST
OREGON
WILLAMETTE, HUMBOLDT AND MT DIABLO MERIDIANS
CRATER LAKE
CRATER LAKE NATIONAL PARK
UPPER KLAMATH LAKE
MEDFORD
ASHLAND
- LEGEND -
AREAS WORKED PRIOR TO 1939
AREAS WORKED DURING 1939
RE-ERADICATION AREAS WORKED DURING 1939
AREAS REMAINING TO BE WORKED
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C.P. WESSELA

U. S. DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

PROGRESS OF BLISTER RUST CONTROL ON THE SISKIYOU NATIONAL FOREST OREGON

WILLAMETTE AND HUMBOLDT MERIDIANS



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BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

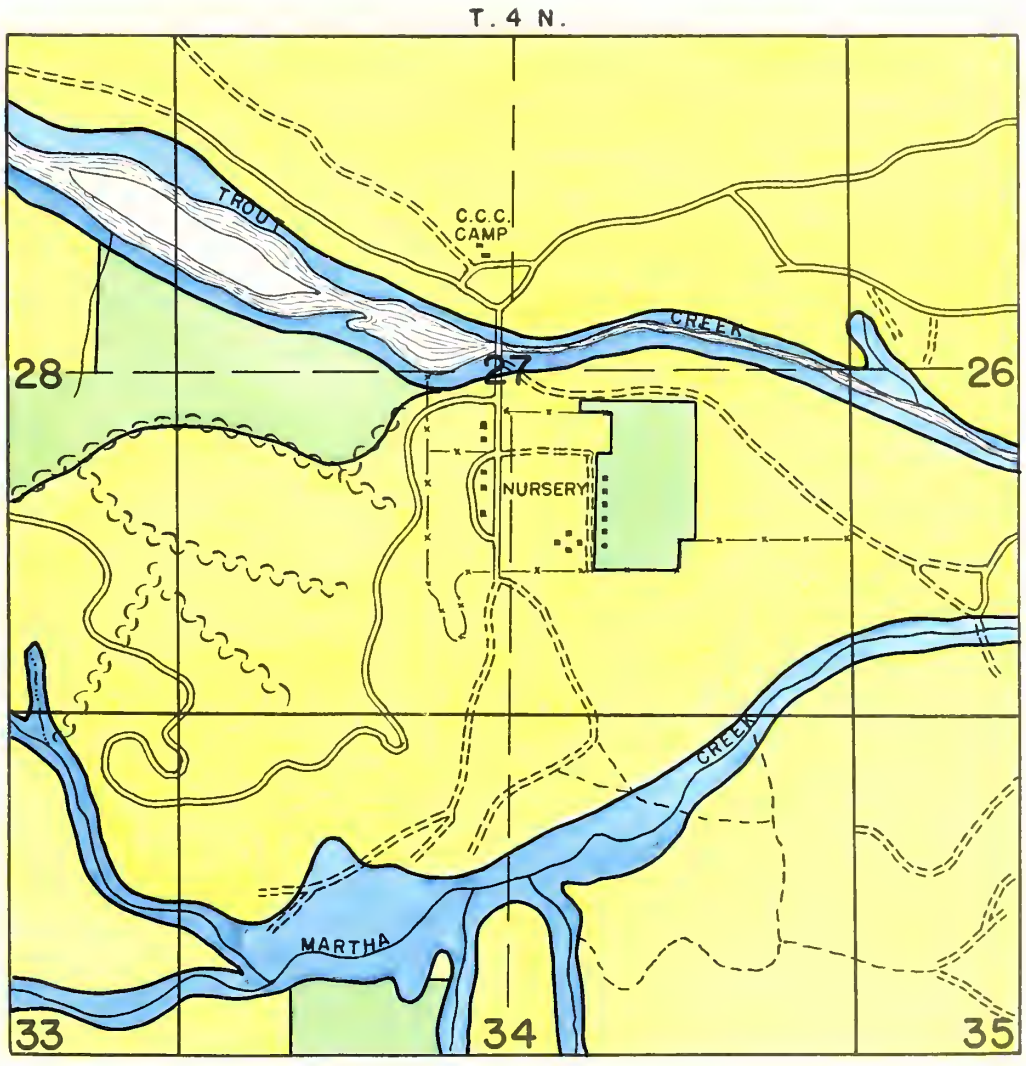
WIND RIVER NURSERY CONTROL UNIT

COLUMBIA NATIONAL FOREST

WASHINGTON

SCALE

0 ¼ ½ ¾ 1-MILE



-LEGEND-

- RIBES FREE AREA
- UPLAND AREA, WORKED
- STREAM TYPE, WORKED

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TABLE 1

THE STATUS OF RIBES ERADICATION BY LAND OWNERSHIP IN THE SUGAR PINE REGION AS OF DECEMBER 31, 1939

PART A - CALIFORNIA

Control Unit	Class of Ownership	Acreage of Control Unite				Status of Eradication														
						First Working			Second Working			Third Working			Fourth Working			Total All Workings		
		White and Sugar Pine Type	Non-White and -Sugar Pine Type	Total Acreage	Acreage Unworked	Acres Worked	Man Days	Ribes	Acres Worked	Man Days	Ribes	Acres Worked	Man Days	Ribes	Acres Worked	Man Days	Ribes	Acres Worked	Man Days	Ribes
NATIONAL FORESTS																				
Mendocino National Forest	Federal	16,290	4,727	21,017	21,017															
	Private	12,967	3,112	15,179	15,179															
	State	40	8	48	48															
	Total	28,197	7,847	36,244	36,244															
Trinity National Forest	Federal	107,268	15,287	122,575	122,575															
	Private	37,214	3,069	40,283	40,283															
	State	2,035	53	2,088	2,088															
	Total	146,537	18,409	164,946	164,946															
Klamath National Forest	Federal	24,690	6,615	31,305	31,305															
	Private	27,555	10,980	38,535	38,535															
	Total	52,245	17,595	69,840	69,840															
Shasta National Forest	Federal	2,615	996	3,611	3,611															
	Private	60,970	13,181	74,151	74,151															
	Total	63,585	14,177	77,762	77,762															
Lassen Natinnal Forest	Federal	35,634	19,220	54,854	47,613	7,241	3,358	542,670	1,339	375	9,462							8,580	3,733	552,132
	Private	205,080	40,341	245,421	217,870	27,551	13,957	1,665,768	5,010	2,179	200,621							32,561	16,136	1,866,389
	State	480	160	640	640	-	-	-	-	-	-							-	-	-
	Total	241,194	59,721	300,915	266,123	34,792	17,315	2,208,438	6,349	2,554	210,083							41,141	19,869	2,418,521
Plumas National Forest	Federal	150,458	41,211	193,669	132,959	60,710	34,510	7,337,990	15,768	9,027	683,690	1,394	816	98,878				77,772	44,353	8,120,558
	Private	140,469	28,193	168,662	107,085	61,567	41,491	8,198,348	5,928	3,325	300,131	736	434	39,538				68,231	45,250	8,538,017
	State	-	322	322	282	40	21	4,620	-	-	-	-	-	-				40	21	4,620
	Total	290,917	71,726	362,643	240,326	122,317	76,022	15,540,958	21,696	12,352	983,821	2,030	1,250	138,416				146,043	89,624	16,663,195
Tahoe National Forest	Federal	16,135	3,600	19,935	19,935															
	Private	18,061	1,920	19,981	19,981															
	Total	34,388	5,520	39,908	39,908															
Eldorado National Forest	Federal	86,584	40,040	126,624	67,086	59,538	28,860	8,316,022	18,806	11,764	763,242							78,344	40,624	9,079,264
	Private	110,837	21,198	132,235	56,479	75,756	44,706	11,956,478	9,614	5,418	355,429							85,370	50,124	12,311,907
	State	2,322	320	2,642	40	2,602	1,634	310,891	-	-	-							2,602	1,634	310,891
	Total	199,743	61,758	261,501	123,605	137,896	75,200	20,583,391	28,420	17,182	1,118,671							166,316	92,382	21,702,062
Stanislaus National Forest	Federal	72,803	30,025	102,828	27,029	75,799	31,498	7,726,808	39,763	16,255	3,187,325	5,941	2,876	215,235	4,716	2,320	141,175	126,219	52,949	11,270,543
	Private	123,042	16,728	139,770	30,194	109,576	51,730	17,923,849	25,076	12,072	1,137,238	960	184	18,453	347	47	1,998	135,959	64,033	19,081,538
	State	320	87	407	-	407	129	16,768	-	-	-	-	-	-	-	-	-	407	129	16,768
	Total	196,165	46,840	*243,005	57,223	185,782	83,357	25,667,425	64,839	28,327	4,324,563	6,901	3,060	233,688	5,063	2,367	143,173	262,585	117,111	30,368,849
Sierra National Forest	Federal	144,163	134,267	278,430	233,273	45,157	80,015	16,821,975	15,054	9,723	5,066,563							60,211	89,738	21,678,538
	Private	47,980	18,670	66,650	50,694	15,956	23,270	5,507,442	1,080	682	151,817							17,036	23,952	5,659,259
	State	10	150	160	160	-	-	-	-	-	-							-	-	-
	Total	192,153	153,087	345,240	284,127	61,113	103,285	22,329,417	16,134	10,405	5,208,380							77,247	113,690	27,337,797
Sequoia National Forest	Federal	19,475	24,455	43,930	43,930															
	Private	9,120	9,760	18,880	18,880															
	Total	28,595	34,215	62,810	62,810															
Total All National Forests	Federal	676,125	322,443	998,768	750,123	348,445	178,241	40,545,465	90,730	47,144	9,700,282	7,335	3,692	314,113	4,716	2,320	141,175	351,126	231,397	50,701,035
	Private	792,387	167,352	959,739	669,333	290,406	175,154	45,251,885	46,708	23,676	2,145,236	1,696	618	57,991	347	47	1,998	339,157	199,495	47,457,110
	State	5,207	1,100	6,307	3,258	3,049	1,784	332,279	-	-	-	-	-	-	-	-	-	3,049	1,784	332,279
	Total	1,473,919	490,895	1,964,814	1,422,914	641,900	355,179	86,129,629	137,438	70,820	11,845,518	8,931	4,310	372,104	5,063	2,367	143,173	693,332	432,676	98,490,424
NATIONAL PARKS																				
Lassen Volcanic National Park	Federal	2,200	9,320	11,520	1,165	10,355	3,202	320,622										10,355	3,202	320,622
	Private	-	140	140	-	140	55	14,977										140	55	14,977
	Total	2,200	9,460	11,660	1,165	10,495	3,257	335,599										10,495	3,257	335,599
Yosemite Nntional Park	Federal	77,236	43,784	120,520	101,781	19,239	33,959	4,448,782	5,743	4,645	632,794							24,982	38,604	5,081,576
	Private	500	2,010	2,510	2,510	-	-	-	-	-	-							-	-	-
	Total	77,736	45,794	123,130	103,891	19,239	33,959	4,448,782	5,743	4,645	632,794							24,982	38,604	5,081,576
General Grant National Park	Federal	2,560	-	2,560	100	2,460	3,189	556,410										2,460	3,189	556,410
Sequoia National Park	Federal	40,315	30,965	71,280	66,624	4,656	4,989	631,084										4,656	4,989	631,084
Total All National Parks	Federal	122,311	83,669	205,980	169,670	36,710	45,339	5,956,898	5,743	4,645	632,794							42,453	49,984	6,589,692
	Private	500	2,150	2,650	2,510	140	55	14,977	-	-	-							140	55	14,977
	Total	122,811	85,819	208,630	171,780	36,850	45,394	5,971,875	5,743	4,645	632,794							42,593	50,039	6,604,669
STATE PARKS																				
Latour State Park	Private	1,920	80	2,000	2,000															
	State	4,146	4,979	9,125	9,125															
	Total	6,066	5,059	11,125	11,125															
Calaveras Big Tree State Park	Private	120	-	120	-	120	21	3,260	-	-	-							120	21	3,260
	State	1,618	355	1,973	225	1,748	1,318	185,001	215	26	4,792							1,963	1,344	189,793
	Total	1,738	355	2,093	225	1,868	1,339	188,261	215	26	4,792							2,083	1,365	193,053
Total All State Parks	Private	2,040	80	2,120	2,000	120	21	3,260	-	-	-							120	21	3,260
	State	5,764	5,334	11,098	9,350	1,748	1,318	185,001	215	26	4,792							1,963	1,344	189,793
	Total	7,804	5,414	13,218	11,350	1,868	1,339	188,261	215	26	4,792							2,083	1,365	193,053
TOTAL																				
Total All Control Units	Federal	798,436	406,112	1,204,548	919,793	385,155	223,580	46,502,363	96,473	51,789	10,333,076	7,335	3,692	314,113	4,716	2,320	141,175	393,579	281,381	57,290,727
	Private	794,927	169,582	964,509	673,843	290,666	175,230	45,270,122	46,708	23,676	2,145,236	1,696	618	57,991	347	47	1,998	339,417	199,571	47,475,347
	State	10,971	6,434	17,405	12,608	4,797	3,102	517,280	215	26	4,792	-	-	-	-	-	-	5,012	3,128	522,072
	Total	1,604,534	582,128	2,186,662	1,606,044	580,618	401,912	92,289,765	143,396	75,491	12,483,104	8,931	4,310	372,104	5,063	2,367	143,173	738,008	484,080	**105,288,146

* Includes 8,206 acres of Private and Federal lands in process of acquisition by Yosemite National Park.

** In addition, it is estimated that 79,200, 51,000, and 25,000 Ribes were destroyed in 1934, 1935, and 1937 respectively by slashing and bulldozer work on the Plumas National Forest.

TABLE 1 (CONTINUED)

THE STATUS OF RIBES ERADICATION BY LAND OWNERSHIP IN THE SUGAR PINE REGION AS OF DECEMBER 31, 1939

PART B - OREGON

Control Unit	Class of Ownership	Acreage of Control Units				Statue of Eradication														
						First Working			Second Working			Third Working			Fourth Working			Total All Workings		
		White and Sugar Pine Type	Non-White and -Sugar Pine Type	Total Acreage	Acreage Unworked	Acres Worked	Man Days	Ribes	Acres Worked	Man Days	Ribes	Acres Worked	Man Days	Ribes	Acres Worked	Man Days	Ribes	Acres Worked	Man Days	Ribes
NATIONAL FORESTS																				
Rogue River National Forest	Federal: National Forest	75,179	18,794	93,973	28,858	65,115	38,357	14,408,640	20,436	5,397	741,078	474	196	9,113				86,025	43,950	15,158,831
	Federal: O & C	11,576	2,894	14,470	9,076	5,394	1,154	196,371	-	-	-	-	-	-				5,394	1,154	196,371
	Federal: Total	86,755	21,688	108,443	37,934	70,509	39,511	14,605,011	20,436	5,397	741,078	474	196	9,113				91,419	45,104	15,355,202
	Private	64,252	16,063	80,315	19,412	69,903	6,902	1,105,988	11,578	1,485	98,465	-	-	-				81,481	8,387	1,204,453
	State	40	-	40	-	40	217	87,560	40	71	16,740	-	-	-				80	288	104,300
	Total	151,047	37,751	188,798	48,346	140,452	46,630	15,798,559	32,054	6,953	855,283	474	196	9,113				172,980	53,779	16,663,955
Siskiyou National Forest	Federal: National Forest	60,397	10,658	71,055	64,530	6,525	1,571	91,302										6,525	1,571	91,302
	Federal: O & C	81,495	14,381	95,876	77,636	18,240	2,930	102,256										18,240	2,930	102,256
	Federal: Total	141,892	25,039	166,931	142,166	24,765	4,501	193,558										24,765	4,501	193,558
	Private	59,874	10,565	70,439	40,639	29,800	4,626	446,884										29,800	4,626	446,884
	State	689	141	830	530	300	43	8,328										300	43	8,328
	Total	202,455	35,745	238,200	183,335	54,865	9,170	648,770										54,865	9,170	648,770
Umpqua National Forest	Federal: National Forest	50,955	12,738	63,693	63,693															
	Federal: O & C	2,752	688	3,440	3,440															
	Federal: Total	53,707	13,426	67,133	67,133															
	Private	6,582	1,645	8,227	8,227															
	State	320	-	320	320															
	Total	60,609	15,071	75,680	75,680															
Siuslaw National Forest	National Forest	140	382	522	-	522	337	119,777	85	66	10,482							607	403	130,259
Mt. Hood National Forest	National Forest	29,016	7,253	36,269	33,620	2,649	1,651	194,292	1,522	939	242,688	244	398	115,168				4,415	2,988	552,148
Total All National Forests	Federal: National Forest	215,687	49,825	265,512	190,701	74,811	41,916	14,814,011	22,043	6,402	994,248	718	594	124,281				97,572	48,912	15,932,540
	Federal: O & C	95,823	17,963	113,786	90,152	23,634	4,084	298,627	-	-	-	-	-	-				23,634	4,084	298,627
	Federal: Total	311,510	67,788	379,298	280,853	98,445	46,000	15,112,638	22,043	6,402	994,248	718	594	124,281				121,206	52,996	16,231,167
	Private	130,708	28,273	158,981	59,278	99,703	11,528	1,552,872	11,578	1,485	98,465	-	-	-				111,281	13,013	1,651,337
	State	1,049	141	1,190	850	340	260	95,888	40	71	16,740	-	-	-				380	331	112,628
	Total	443,267	96,202	539,469	340,981	198,488	57,788	16,761,398	33,661	7,958	1,109,453	718	594	124,281				232,867	66,340	17,995,132
NATIONAL PARKS																				
Crater Lake National Park	Federal	1,295	-	1,295	150	1,145	376	119,913										1,145	376	119,913
TOTAL																				
Total All Control Units	Federal	312,805	67,788	380,593	281,003	99,590	46,376	15,232,551	22,043	6,402	994,248	718	594	124,281				122,351	53,372	16,351,080
	Private	130,708	28,273	158,981	59,278	99,703	11,528	1,552,872	11,578	1,485	98,465	-	-	-				111,281	13,013	1,651,337
	State	1,049	141	1,190	850	340	260	95,888	40	71	16,740	-	-	-				380	331	112,628
	Total	444,562	96,202	540,764	341,131	199,633	58,164	16,881,311	33,661	7,958	1,109,453	718	594	124,281				234,012	66,716	18,115,045

PART C - TOTAL FOR THE REGION

California and Oregon	Federal	1,111,441	473,900	1,585,341	1,200,596	384,745	269,956	61,734,914	118,516	58,191	11,327,324	7,953	4,286	438,394	4,716	2,320	141,175	515,930	334,753	73,641,807
	Private	925,635	197,855	1,123,490	733,121	390,369	186,758	46,822,994	58,286	25,161	2,243,701	1,696	618	57,991	347	47	1,998	450,698	212,584	49,126,684
	State	12,020	6,575	18,595	13,458	5,137	3,362	613,168	255	97	21,532	-	-	-	-	-	-	5,392	3,459	634,700
	Total	2,049,096	678,330	2,727,426	1,947,175	780,251	460,076	109,171,076	177,057	83,449	13,592,557	9,649	4,904	496,385	5,063	2,367	143,173	972,020	550,796	123,403,191

TABLE 2

SUMMARY OF ALL RIBES ERADICATION IN THE SUGAR PINE REGION, 1939

Type of Fund	Class of Work	Acres Worked	Number of 8-Hour Man Days	Total Ribes Eradicated
Bureau of Entomology and Plant Quarantine				
ERA	First Working	63,114	43,030	8,099,733
	Third Working	474	196	9,113
	Total	63,588	43,226	8,108,846
State WPA	First Working	28,029	4,609	393,421
Total Bureau	First Working	91,143	47,639	8,493,154
	Third Working	474	196	9,113
	Total	91,617	47,835	8,502,267
Forest Service				
ERA	First Working	3,418	1,901	291,336
	Second Working	27,334	14,523	964,407
	Third Working	1,368	963	124,604
	Total	32,120	17,387	1,380,347
CCC	First Working	11,681	18,381	2,748,785
	Second Working	6,923	7,701	447,400
	Total	18,604	26,082	3,196,185
Regular	First Working	707	562	110,614
	Second Working	30,316	10,085	2,086,979
	Third Working	662	287	13,812
	Total	31,685	10,934	2,211,405
Total Forest Service	First Working	15,806	20,844	3,150,735
	Second Working	64,573	32,309	3,498,786
	Third Working	2,030	1,250	138,416
	Total	82,409	54,403	6,787,937
National Park Service				
CCC	First Working	21,592	28,487	3,481,149
	Second Working	5,453	4,394	568,036
	Total	27,045	32,881	4,049,185
All Agencies				
Sugar Pine Region	First Working	128,541	96,970	15,125,038
	Second Working	70,026	36,703	4,066,822
	Third Working	2,504	1,446	147,529
	Total	201,071	135,119	19,339,389

TABLE 3

SUMMARY OF RIBES ERADICATION BY OPERATIONS FOR CALIFORNIA - 1939

PART A - Initial Work

Agency	Type of Funds	Acres Worked	Acres Blocked Out	Acres Total	Man Hours	Total Ribes Eradicated	Per Acre Worked: 8-Hour Man Days	Per Acre Worked: Ribes	Ownership Status: Acres Covered: Federal	Acres Covered: Private	Acres Covered: Total	Number 8-Hour Man Days: Federal	Number 8-Hour Man Days: Private	Number 8-Hour Man Days: Total	Ribes Eradicated: Federal	Ribes Eradicated: Private	Ribes Eradicated: Total
LASSEN NATIONAL FOREST																	
Forest Service	E R A	1,835	1,200	3,035	11,624	207,989	0.79	113	1,255	1,780	3,035	743	710	1,453	107,548	100,441	207,989
	C C C	6,943	199	7,142	50,784	591,578	0.91	85	935	6,207	7,142	1,036	5,312	6,348	117,673	473,905	591,578
Total - - - - - - - -		8,778	1,399	10,177	62,408	799,567	0.89	91	2,190	7,987	10,177	1,779	6,022	7,801	225,221	574,346	799,567
PLUMAS NATIONAL FOREST																	
Forest Service	C C C	998	1,341	2,339	31,568	338,841	3.95	340	1,030	1,309	2,339	150	3,796	3,946	8,800	330,041	338,841
	Regular	145	3	148	1,128	12,121	0.97	84	136	12	148	123	18	141	8,596	3,525	12,121
Total - - - - - - - -		1,143	1,344	2,487	32,696	350,962	3.58	307	1,166	1,321	2,487	273	3,814	4,087	17,396	333,566	350,962
ELDORADO NATIONAL FOREST																	
Forest Service	E R A	383	-	383	3,584	83,347	1.17	218	243	140	383	287	161	448	52,017	31,330	83,347
STANISLAUS NATIONAL FOREST																	
Forest Service	C C C	120	-	120	3,040	81,636	3.17	680	120	-	120	380	-	380	81,636	-	81,636
	Regular	320	-	320	848	17,085	0.33	53	320	-	320	106	-	106	17,085	-	17,085
Total - - - - - - - -		440	-	440	3,888	98,721	1.10	224	440	-	440	486	-	486	98,721	-	98,721
SIERRA NATIONAL FOREST																	
Bureau	E R A	26,878	-	26,878	252,352	6,218,683	1.17	231	16,550	10,328	26,878	19,066	12,478	31,544	3,170,818	3,047,865	6,218,683
Forest Service	C C C	2,080	-	2,080	61,656	1,736,730	3.71	835	1,840	240	2,080	7,277	430	7,707	1,652,040	84,690	1,736,730
	Regular	239	-	239	2,520	81,408	1.32	341	239	-	239	315	-	315	81,408	-	81,408
	Total	2,319	-	2,319	64,176	1,818,138	3.46	784	2,079	240	2,319	7,592	430	8,022	1,733,448	84,690	1,818,138
Total - - - - - - - -		29,197	-	29,197	316,528	8,036,821	1.36	275	18,629	10,568	29,197	26,658	12,908	39,566	4,904,266	3,132,555	8,036,821
NATIONAL FOREST TOTALS																	
Bureau	E R A	26,878	-	26,878	252,352	6,218,683	1.17	231	16,550	10,328	26,878	19,066	12,478	31,544	3,170,818	3,047,865	6,218,683
Forest Service	E R A	2,218	1,200	3,418	15,208	291,336	0.86	131	1,498	1,920	3,418	1,030	871	1,901	159,565	131,771	291,336
	C C C	10,141	1,540	11,681	147,048	2,748,785	1.81	271	3,925	7,756	11,681	8,843	9,538	18,381	1,860,149	888,636	2,748,785
	Regular	704	3	707	4,496	110,614	0.80	157	695	12	707	544	18	562	107,089	3,525	110,614
	Total	13,063	2,743	15,806	166,752	3,150,735	1.60	241	6,118	9,688	15,806	10,417	10,427	20,844	2,126,803	1,023,932	3,150,735
Total - - - - - - - -		39,941	2,743	42,684	419,104	9,369,418	1.31	235	22,668	20,016	42,684	29,483	22,905	52,388	5,297,621	4,071,797	9,369,418
NATIONAL PARKS																	
Lassen Volcanic	C C C	2,022	3,740	5,762	12,048	149,355	0.74	74	5,762	-	5,762	1,506	-	1,506	149,355	-	149,355
Yosemite	C C C	9,035	1,482	10,517	162,840	2,405,364	2.25	266	10,517	-	10,517	20,355	-	20,355	2,405,364	-	2,405,364
General Grant	C C C	657	-	657	13,096	295,346	2.49	450	657	-	657	1,637	-	1,637	295,346	-	295,346
Sequoia	C C C	4,656	-	4,656	39,912	631,084	1.07	136	4,656	-	4,656	4,989	-	4,989	631,084	-	631,084
Total - - - - - - - -		16,370	5,222	21,592	227,896	3,481,149	1.74	213	21,592	-	21,592	28,487	-	28,487	3,481,149	-	3,481,149
CALIFORNIA TOTALS																	
All Agencies	E R A	29,096	1,200	30,296	267,560	6,510,019	1.15	224	18,048	12,248	30,296	20,096	13,349	33,445	3,330,383	3,179,636	6,510,019
	C C C	26,511	6,762	33,273	374,944	6,229,934	1.77	235	25,517	7,756	33,273	37,330	9,538	46,868	5,341,298	888,636	6,229,934
	Regular	704	3	707	4,496	110,614	0.80	157	695	12	707	544	18	562	107,089	3,525	110,614
Total - - - - - - - -		56,311	7,965	64,276	647,000	12,850,567	1.44	228	44,260	20,016	64,276	57,970	22,905	80,875	8,778,770	4,071,797	12,850,567

TABLE 3 (CONTINUED)

SUMMARY OF RIBES ERADICATION BY OPERATIONS FOR CALIFORNIA - 1939

PART B - Reeradication

Agency	Type of Funds	Class of Work	Acres Worked	Man Hours	Total Ribes Eradicated	Per Acre Worked: 8-Hour Man Days	Per Acre Worked: Ribes	Ownership Status: Acres Covered: Federal	Acres Covered: Private	Acres Covered: Total	Number 8-Hour Man Days: Federal	Number 8-Hour Man Days: Private	Number 8-Hour Man Days: Total	Ribes Eradicated: Federal	Ribes Eradicated: Private	Ribes Eradicated: Total	Acreage Ribes-free at time of Re-eradication
PLUMAS NATIONAL FOREST																	
Forest Service	E R A	Second Working	11,491	58,800	582,762	0.64	51	8,629	2,862	11,491	5,717	1,633	7,350	435,773	146,989	582,762	7,977
		Third Working	1,368	7,704	124,604	0.70	91	700	668	1,368	546	417	963	86,073	38,531	124,604	1,179
		Total	12,859	66,504	707,366	0.65	55	9,329	3,530	12,859	6,263	2,050	8,313	521,846	185,520	707,366	9,156
	C C C	Second Working	1,175	3,424	11,963	0.36	10	470	705	1,175	179	249	428	4,016	7,947	11,963	4,537
	Regular	Second Working	2,377	12,744	125,012	0.67	53	1,587	790	2,377	1,055	538	1,593	83,141	41,871	125,012	788
		Third Working	662	2,296	13,812	0.43	21	594	68	662	270	17	287	12,805	1,007	13,812	385
		Total	3,039	15,040	138,824	0.62	46	2,181	858	3,039	1,325	555	1,880	95,946	42,878	138,824	1,173
	All Funds	Second Working	15,043	74,968	719,737	0.62	48	10,686	4,357	15,043	6,951	2,420	9,371	522,930	196,807	719,737	13,302
		Third Working	2,030	10,000	138,416	0.62	68	1,294	736	2,030	816	434	1,250	98,878	39,538	138,416	1,564
Total All Workings - - - - - - -			17,073	84,968	858,153	0.62	50	11,980	5,093	17,073	7,767	2,854	10,621	621,808	236,345	858,153	14,866
ELDORADO NATIONAL FOREST																	
Forest Service	E R A	Second Working	15,843	57,384	381,645	0.45	24	10,269	5,574	15,843	4,956	2,217	7,173	271,172	110,473	381,645	2,377
	C C C	Second Working	2,480	32,520	333,681	1.64	135	2,080	400	2,480	3,369	696	4,065	284,403	49,278	333,681	20
	Regular	Second Working	4,519	9,680	57,172	0.27	13	3,215	1,304	4,519	808	402	1,210	41,367	15,805	57,172	1,189
Total All Workings - - - - - - -			22,842	99,584	772,498	0.55	34	15,564	7,278	22,842	9,133	3,315	12,448	596,942	175,556	772,498	3,586
STANISLAUS NATIONAL FOREST																	
Forest Service	C C C	Second Working	3,268	25,664	101,756	0.98	31	240	3,028	3,268	350	2,858	3,208	21,751	80,005	101,756	264
	Regular	Second Working	16,202	33,504	409,490	0.26	25	12,145	4,057	16,202	3,127	1,061	4,188	282,909	126,581	409,490	5,825
Total All Workings - - - - - - -			19,470	59,168	511,246	0.38	26	12,385	7,085	19,470	3,477	3,919	7,396	304,660	206,586	511,246	6,089
SIERRA NATIONAL FOREST																	
Forest Service	Regular	Second Working	7,218	24,752	1,495,305	0.43	207	6,478	740	7,218	2,850	244	3,094	1,409,609	85,696	1,495,305	510
NATIONAL FOREST TOTALS																	
Forest Service	E R A	Second Working	27,334	116,184	964,407	0.53	35	18,898	8,436	27,334	10,673	3,850	14,523	706,945	257,462	964,407	10,354
		Third Working	1,368	7,704	124,604	0.70	91	700	668	1,368	546	417	963	86,073	38,531	124,604	1,179
		Total	28,702	123,888	1,089,011	0.54	38	19,598	9,104	28,702	11,219	4,267	15,486	793,018	295,993	1,089,011	11,533
	C C C	Second Working	6,923	61,608	447,400	1.11	65	2,790	4,133	6,923	3,898	3,803	7,701	310,170	137,230	447,400	4,821
	Regular	Second Working	30,316	80,680	2,086,979	0.33	69	23,425	6,891	30,316	7,340	2,245	10,085	1,817,026	269,953	2,086,979	8,312
		Third Working	662	2,296	13,812	0.43	21	594	68	662	270	17	287	12,805	1,007	13,812	385
		Total	30,978	82,976	2,100,791	0.33	68	24,019	6,959	30,978	8,110	2,262	10,372	1,829,831	270,960	2,100,791	8,697
	All Funds	Second Working	64,573	258,472	3,498,786	0.50	54	45,113	19,460	64,573	22,411	9,898	32,309	2,834,141	664,645	3,498,786	23,487
		Third Working	2,030	10,000	138,416	0.62	68	1,294	736	2,030	816	434	1,250	98,878	39,538	138,416	1,564
Total All Workings - - - - - - -			66,603	268,472	3,637,202	0.50	55	46,407	20,196	66,603	23,227	10,332	33,559	2,933,019	704,183	3,637,202	25,051
YOSEMITE NATIONAL PARK																	
National Park Service	C C C	Second Working	5,453	35,152	568,036	0.81	104	5,453	-	5,453	4,394	-	4,394	568,036	-	568,036	3,882
CALIFORNIA TOTALS																	
Total All Agencies	E R A	Second Working	27,334	116,184	964,407	0.53	35	18,898	8,436	27,334	10,673	3,850	14,523	706,945	257,462	964,407	10,354
		Third Working	1,368	7,704	124,604	0.70	91	700	668	1,368	546	417	963	86,073	38,531	124,604	1,179
		Total	28,702	123,888	1,089,011	0.54	38	19,598	9,104	28,702	11,219	4,267	15,486	793,018	295,993	1,089,011	11,533
	C C C	Second Working	12,376	96,760	1,015,436	0.98	82	8,243	4,133	12,376	8,292	3,803	12,095	878,206	137,230	1,015,436	8,703
	Regular	Second Working	30,316	80,680	2,086,979	0.33	69	23,425	6,891	30,316	7,340	2,245	10,085	1,817,026	269,953	2,086,979	8,312
		Third Working	662	2,296	13,812	0.43	21	594	68	662	270	17	287	12,805	1,007	13,812	385
		Total	30,978	82,976	2,100,791	0.33	68	24,019	6,959	30,978	8,110	2,262	10,372	1,829,831	270,960	2,100,791	8,697
	All Funds	Second Working	70,026	293,624	4,066,822	0.52	58	50,566	19,460	70,026	26,805	9,898	36,703	3,402,177	664,645	4,066,822	27,369
		Third Working	2,030	10,000	138,416	0.62	68	1,294	736	2,030	816	434	1,250	98,878	39,538	138,416	1,564
Total All Workings - - - - - - -			72,056	303,624	4,205,238	0.53	58	51,860	20,196	72,056	27,621	10,332	37,953	3,501,055	704,183	4,205,238	28,933

TABLE 3 (CONTINUED)

SUMMARY OF RIBES ERADICATION BY OPERATIONS FOR CALIFORNIA - 1939

PART C - All Workings

Agency	Type of Funds	Acres Worked*	Man Hours	Total Ribes Eradicated	Ownership Status: Acres Covered			Number 8-Hour Man Days			Ribes Eradicated		
					Federal	Private	Total	Federal	Private	Total	Federal	Private	Total
LASSEN NATIONAL FOREST													
Forest Service	E R A	3,035	11,624	207,989	1,255	1,780	3,035	743	710	1,453	107,548	100,441	207,989
	C C C	7,142	50,784	591,578	935	6,207	7,142	1,036	5,312	6,348	117,673	473,905	591,578
Total		10,177	62,408	799,567	2,190	7,987	10,177	1,779	6,022	7,801	225,221	574,346	799,567
PLUMAS NATIONAL FOREST													
Forest Service	E R A	12,859	66,504	707,366	9,329	3,530	12,859	6,263	2,050	8,313	521,846	185,520	707,366
	C C C	3,514	34,992	350,804	1,500	2,014	3,514	329	4,045	4,374	12,816	337,988	350,804
	Regular	3,187	16,168	150,945	2,317	870	3,187	1,448	573	2,021	104,542	46,403	150,945
Total		19,560	117,664	1,209,115	13,146	6,414	19,560	8,040	6,668	14,708	639,204	569,911	1,209,115
ELDORADO NATIONAL FOREST													
Forest Service	E R A	16,226	60,968	464,992	10,512	5,714	16,226	5,243	2,378	7,621	323,189	141,803	464,992
	C C C	2,480	32,520	333,681	2,080	400	2,480	3,369	696	4,065	284,403	49,278	333,681
	Regular	4,519	9,680	57,172	3,215	1,304	4,519	808	402	1,210	41,367	15,805	57,172
Total		23,225	103,168	855,845	15,807	7,418	23,225	9,420	3,476	12,896	648,959	206,886	855,845
STANISLAUS NATIONAL FOREST													
Forest Service	C C C	3,388	28,704	183,392	360	3,028	3,388	730	2,858	3,588	103,387	80,005	183,392
	Regular	16,522	34,352	426,575	12,465	4,057	16,522	3,233	1,061	4,294	299,994	126,581	426,575
Total		19,910	63,056	609,967	12,825	7,085	19,910	3,963	3,919	7,882	403,381	206,586	609,967
SIERRA NATIONAL FOREST													
Bureau	E R A	26,878	252,352	6,218,683	16,550	10,328	26,878	19,066	12,478	31,544	3,170,818	3,047,865	6,218,683
Forest Service	C C C	2,080	61,656	1,736,730	1,840	240	2,080	7,277	430	7,707	1,652,040	84,690	1,736,730
	Regular	7,457	27,272	1,576,713	6,717	740	7,457	3,165	244	3,409	1,491,017	85,696	1,576,713
	Total	9,537	88,928	3,313,443	8,557	980	9,537	10,442	674	11,116	3,143,057	170,386	3,313,443
Total		36,415	341,280	9,532,126	25,107	11,308	36,415	29,508	13,152	42,660	6,313,875	3,218,251	9,532,126
NATIONAL FOREST TOTALS													
Bureau	E R A	26,878	252,352	6,218,683	16,550	10,328	26,878	19,066	12,478	31,544	3,170,818	3,047,865	6,218,683
Forest Service	E R A	32,120	139,096	1,380,347	21,096	11,024	32,120	12,249	5,138	17,387	952,583	427,764	1,380,347
	C C C	18,604	208,656	3,196,185	6,715	11,889	18,604	12,741	13,341	26,082	2,170,319	1,025,866	3,196,185
	Regular	31,685	87,472	2,211,405	24,714	6,971	31,685	8,654	2,280	10,934	1,936,920	274,485	2,211,405
	Total	82,409	435,224	6,787,937	52,525	29,884	82,409	33,644	20,759	54,403	5,059,822	1,728,115	6,787,937
Total		109,287	687,576	13,006,620	69,075	40,212	109,287	52,710	33,237	85,947	8,230,640	4,775,980	13,006,620
NATIONAL PARKS													
Lassen Volcanic	C C C	5,762	12,048	149,355	5,762	-	5,762	1,506	-	1,506	149,355	-	149,355
Yosemite	C C C	15,970	197,992	2,973,400	15,970	-	15,970	24,749	-	24,749	2,973,400	-	2,973,400
General Grant	C C C	657	13,096	295,346	657	-	657	1,637	-	1,637	295,346	-	295,346
Sequoia	C C C	4,656	39,912	631,084	4,656	-	4,656	4,989	-	4,989	631,084	-	631,084
Total		27,045	263,048	4,049,185	27,045	-	27,045	32,881	-	32,881	4,049,185	-	4,049,185
CALIFORNIA TOTALS													
All Agencies	E R A	58,998	391,448	7,599,030	37,646	21,352	58,998	31,315	17,616	48,931	4,123,401	3,475,629	7,599,030
	C C C	45,649	471,704	7,245,370	33,760	11,889	45,649	45,622	13,341	58,963	6,219,504	1,025,866	7,245,370
	Regular	31,685	87,472	2,211,405	24,714	6,971	31,685	8,654	2,280	10,934	1,936,920	274,485	2,211,405
Total		136,332	950,624	17,055,805	96,120	40,212	136,332	85,591	33,237	118,828	12,279,825	4,775,980	17,055,805

* Includes worked and blocked-out acres on initial eradication, but only acres worked on all subsequent eradications.

TABLE 4

SUMMARY OF RIBES ERADICATION FOR OREGON, 1939

Agency and Type of Funds	Class of Work	Acres			Man Hours	Total Ribes Eradicated	Per Acre Worked		Ownership Status																		Acreage Ribes-free at time of Re-eradication
									Acres Covered						Number 8-Hour Man Days						Ribes Eradicated						
									Federal						Federal						Federal						
		Worked	Blocked Out	Total			8-Hour Man Days	Ribes	National Forest	O & C	Total	State	Private	Total	National Forest	O & C	Total	State	Private	Total	National Forest	O & C	Total	State	Private	Total	
ROGUE RIVER NATIONAL FOREST																											
Bureau - ERA	First Working	7,275	2,375	9,650	55,464	1,625,805	0.95	223	9,650	-	9,650	-	-	9,650	6,933	-	6,933	-	-	6,933	1,625,805	-	1,625,805	-	-	1,625,805	-
	Third Working	474	-	474	1,568	9,113	0.41	19	474	-	474	-	-	474	196	-	196	-	-	196	9,113	-	9,113	-	-	9,113	41
Total - - - - - - - -		7,749	2,375	10,124	57,032	1,634,918	0.92	211	10,124	-	10,124	-	-	10,124	7,129	-	7,129	-	-	7,129	1,634,918	-	1,634,918	-	-	1,634,918	41
SISKIYOU NATIONAL FOREST																											
Bureau - ERA	First Working	10,090	16,496	26,586	36,424	255,245	0.45	25	785	10,155	10,940	187	15,459	26,586	329	1,615	1,944	30	2,579	4,553	18,925	60,000	78,925	7,352	168,968	255,245	-
State - WPA	First Working	8,436	19,593	28,029	36,872	393,421	0.55	47	5,535	8,040	13,575	113	14,341	28,029	1,235	1,314	2,549	13	2,047	4,609	72,273	42,256	114,529	976	277,916	393,421	-
Total - - - - - - - -		18,526	36,089	54,615	73,296	648,666	0.49	35	6,320	18,195	24,515	300	29,800	54,615	1,564	2,929	4,493	43	4,626	9,162	91,198	102,256	193,454	8,328	446,884	648,666	-
TOTAL																											
All Agencies	First Working	25,801	38,464	64,265	128,760	2,274,471	0.62	88	15,970	18,195	34,165	300	29,800	64,265	8,497	2,929	11,426	43	4,626	16,095	1,717,003	102,256	1,819,259	8,328	446,884	2,274,471	-
	Third Working	474	-	474	1,568	9,113	0.41	19	474	-	474	-	-	474	196	-	196	-	-	196	9,113	-	9,113	-	-	9,113	41
Total- - - - - - - -		26,275	38,464	64,739	130,328	2,283,584	0.62	87	16,444	18,195	34,639	300	29,800	64,739	8,693	2,929	11,622	43	4,626	16,291	1,726,116	102,256	1,828,372	8,328	446,884	2,283,584	41

TABLE 5

RIBES ERADICATED BY SPECIES - CALIFORNIA, 1939

Agency	Class of Work	Ribes roezli	Ribes nevadense	Ribes viscosissimum	Ribes cereum	Ribes inerme	Ribes montigenum	Total Ribes Eradicated
Lassen National Forest	First Working	701,138	93,261	1,821	56	3,291	-	799,567
Plumas National Forest	First Working	245,799	95,780	-	-	9,383	-	350,962
	Second Working	508,663	158,357	11,404	-	41,313	-	719,737
	Third Working	83,054	54,239	-	-	1,123	-	138,416
	Total - - - -	837,516	308,376	11,404	-	51,819	-	1,209,115
Eldorado National Forest	First Working	77,609	2,310	-	3,428	-	-	83,347
	Second Working	697,278	49,316	15,896	10,008	-	-	772,498
	Total - - - -	774,887	51,626	15,896	13,436	-	-	855,845
Stanislaus National Forest	First Working	92,763	5,449	396	113	-	-	98,721
	Second Working	472,708	33,300	2,937	2,301	-	-	511,246
	Total - - - -	565,471	38,749	3,333	2,414	-	-	609,967
Sierra National Forest	First Working	6,805,205	1,065,107	110,232	56,277	-	-	8,036,821
	Second Working	1,387,286	108,019	-	-	-	-	1,495,305
	Total - - - -	8,192,491	1,173,126	110,232	56,277	-	-	9,532,126
Lassen Volcanic National Park	First Working	19,759	25,890	61,140	26,893	-	15,673	149,355
Yosemite National Park	First Working	1,903,287	259,845	228,010	14,222	-	-	2,405,364
	Second Working	547,827	20,209	-	-	-	-	568,036
	Total - - - -	2,451,114	280,054	228,010	14,222	-	-	2,973,400
General Grant National Park	First Working	215,264	30,600	-	49,482	-	-	295,346
Sequoia National Park	First Working	222,011	310,330	81,913	16,830	-	-	631,084
Total All Agencies	First Working	10,282,835	1,888,572	483,512	167,301	12,674	15,673	12,850,567
	Second Working	3,613,762	369,201	30,237	12,309	41,313	-	4,066,822
	Third Working	83,054	54,239	-	-	1,123	-	138,416
	Total - - - -	13,979,651	2,312,012	513,749	179,610	55,110	15,673	17,055,805

TABLE 6

RIBES ERADICATED BY SPECIES - OREGON, 1939

Agency	Class of Work	Ribes binominatum	Ribes bracteosum	Ribes cereum	Ribes cruentum	Ribes erythrocarpum	Ribes klamathense	Ribes lacustre	Ribes lobbii	Ribes sanguineum	Ribes triste	Ribes viscosissimum	Total Ribes Eradicated
Rogue River National Forest	First Working	439,090	9,474	277,645	13,682	483	12,917	739,251	76,228	23,793	6,569	26,673	1,625,805
	Third Working	1,106	-	-	3,954	-	184	905	2,711	215	-	38	9,113
	Total - - -	440,196	9,474	277,645	17,636	483	13,101	740,156	78,939	24,008	6,569	26,711	1,634,918
Siskiyou National Forest	First Working	-	-	-	209,958	-	345,068	-	811	92,631	-	198	648,666
Total All Agencies	First Working	439,090	9,474	277,645	223,640	483	357,985	739,251	77,039	116,424	6,569	26,871	2,274,471
	Third Working	1,106	-	-	3,954	-	184	905	2,711	215	-	38	9,113
	Total - - -	440,196	9,474	277,645	227,594	483	358,169	740,156	79,750	116,639	6,569	26,909	2,283,584

TABLE 7

THE DISTRIBUTION OF CAMPS BY OPERATION AND COUNTY IN THE SUGAR PINE REGION DURING 1939

Control Unit	Agency and Fund	County	Number and Average Size of Camps	Approximate Period of Operation	Location
Rogue River National Forest	EQ - ERA	Jackson	1-100; 2-33 Man	May 1 - Oct. 1	Buck Basin Flat Creek and Union Creek
*Siskiyou National Forest	EQ - WPA	Josephine	1-65 Man	May 1 - July 1	Selma
Lassen National Forest	FS - ERA	Tehama	1-80 Man	May 1 - June 30	Gurnsey Creek
	FS - CCC	Tehama	1-100; 1-50 Man	May 10 - Oct. 15	Deer Creek and Soda Springs
Plumas National Forest	FS - ERA	Plumas	2-40; 2-80 Man	May 15 - Oct. 1	Deanes Valley, Greens Flat and Snake Lake
	FS - CCC	Plumas	1-20; 1-150 Man	May 15 - Oct. 10	Long & Humbug Valley; Feather River
	FS - Regular	Plumas	2-33 Man	July 10 - Oct. 1	Deanes Valley and Round Valley
Eldorado National Forest	FS - ERA	El Dorado	4-45 Man	May 1 - Sept. 25	Huots, Alder Ridge, Hells Delight and Schneider
	FS - CCC	El Dorado	1-100 Man	May 10 - Oct. 15	Caldor
	FS - Regular	El Dorado	1-33 Man	July - Oct. 1	Owens Camp
Stanislaus National Forest	FS - CCC	Tuolumne	1-25; 1-130 Man	June 1 - Oct. 1	Strawberry and Skull Creek
	FS - Regular	Tuolumne	2-33 Man	May 20 - Oct. 1	Mather and Campoodle
Sierra National Forest	EQ - ERA	Fresno	6-100 Man	May 5 - Oct. 30	Music Mt., Bench and Lost Mdws., Markwood and Exchequer Creeks McKinley Grove
	FS - CCC	Madera	1-120 Man	May 1 - Oct. 30	Soquel
	FS - Regular	Mariposa	2-33 Man	June 20 - Oct. 15	Miami Creek and Summit
Lassen Volcanic National Park	NPS - CCC	Shasta	1-25 Man	July 17 - Sept. 20	Twin Lakes
	NPS - CCC	Shasta	1-20 Man	June 5 - Sept. 10	Lost Creek
Yosemite National Park	NPS - CCC	Tuolumne	1-150; 1-100 Man	May 20 - Oct. 30	Middle Fork and Crane Flat
	NPS - CCC	Mariposa	2-120; 1-150 Man	May 1 - Oct. 15	Tamarack, Empire Meadows, Wawona
General Grant National Park	NPS - CCC	Fresno	1-40 Man	June 1 - Sept. 15	General Grant National Park
Sequoia National Park	NPS - CCC	Tulare	1-110 Man	June 10 - Oct.	Marble Fork

*After July 1 this was a State WPA project. The men were trucked to the job from Grants Pass and no camp was maintained.

TABLE 8

TOTAL EXPENDITURES FOR THE SUGAR PINE REGION BY AGENCY AND TYPE OF FUND FOR THE CALENDAR YEAR 1939

Agency	California				Oregon			Total
	Regular	ERA	CCC	Total	Regular	ERA	Total	
Bureau	$ 35,724.36	$251,009.50	-	$286,733.86	$8,086.19	$ 82,570.60	$ 90,656.79	$377,390.65
Forest Service	161,141.01	132,874.97	$29,313.68	323,329.66	-	-	-	323,329.66
Park Service	-	-	18,800.74	18,800.74	-	-	-	18,800.74
State WPA	-	-	-	-	-	20,665.68	20,665.68	20,665.68
Total - - -	$196,865.37	$383,884.47	$48,114.42	$628,864.26	$8,086.19	$103,236.28	$111,322.47	$740,186.73

TABLE 9

CLASSIFIED BUREAU EXPENDITURES BY APPROPRIATIONS AND PROJECTS - SUGAR PINE REGION

January 1 to December 31, 1939

Item	Appropriation	Plumas and Lassen	Sierra	Eldorado	Stanislaus	Expenditures Not Directly Chargeable to Field Projects	California Scouting	Total not Including Methods Unit	*Methods Unit (Berkeley)	Sub-Total	Oregon	Totals
Salaries: Permanent Employees	EQ-Regular 1291300.090	$ 1,641.66	$ 1,697.28	$ 3,000.00	$ 3,000.00	$ 5,973.24	-	$ 15,312.18	$ 8,116.57	$ 23,428.75	$ 3,352.76	$ 26,781.51
	" " 1201300.090	3,150.00	2,218.33	1,555.00	1,697.28	7,034.28	-	15,654.89	7,108.23	22,763.12	3,675.00	26,438.12
	WPA-Emergency 701082	-	-	-	-	1,290.83	-	1,290.83	-	1,290.83	-	1,290.83
	" " 201087-650999	-	2,597.27	-	-	2,439.00	-	5,036.27	541.65	5,577.92	-	5,577.92
	WPA-Administrative 701009	-	-	-	-	5,101.35	-	5,101.35	-	5,101.35	-	5,101.35
	" " 201088-650999	-	-	-	-	2,547.83	-	2,547.83	-	2,547.83	-	2,547.83
Total		4,791.66	6,512.88	4,555.00	4,697.28	24,386.53	-	44,943.35	15,766.45	60,709.80	7,027.76	67,737.56
Salaries and Wages: Temporary Employees	EQ-Regular 1291300.090	-	126.75	-	56.25	2,804.25	-	2,987.25	155.00	3,142.25	859.00	4,001.25
	" " 1201300.090	-	-	-	252.00	-	487.59	739.59	450.00	1,189.59	108.75	1,298.34
	WPA-Emergency 701082	229.00	53,128.20	-	-	14,993.80	990.65	69,341.65	511.92	69,853.57	37,328.17	107,181.74
	" " 201087-650999	337.50	80,797.09	-	-	8,816.91	1,419.73	91,371.23	861.06	92,232.29	24,328.62	116,560.91
	WPA-Administrative 701009	-	-	-	-	810.00	-	810.00	-	810.00	-	810.00
	" " 201088-650999	-	-	-	-	150.42	-	150.42	-	150.42	-	150.42
Total		566.50	134,052.04	-	308.25	27,575.38	2,897.97	165,400.14	1,977.98	167,378.12	62,624.54	230,002.66
Equipment: Non- and Semi-Expendable	EQ-Regular 1291300.090	-	-	-	-	392.37	-	392.37	56.98	449.35	-	449.35
	" " 1201300.090	-	-	-	-	-	-	-	556.50	556.50	-	556.50
	WPA-Emergency 701082	3.19	69.83	3.19	3.20	2,895.36	27.64	3,002.41	-	3,002.41	4,036.81	7,039.22
	" " 201087-650999	-	23.50	-	-	62.05	-	85.55	-	85.55	56.01	141.56
	WPA-Administrative 701009	-	-	-	-	509.66	-	509.66	-	509.66	-	509.66
	" " 201088-650999	-	-	-	-	-	-	-	-	-	-	-
Total		3.19	93.33	3.19	3.20	3,859.44	27.64	3,989.99	613.48	4,603.47	4,092.82	8,696.29
Subsistence Supplies	EQ-Regular 1291300.090	-	-	-	-	-	-	-	-	-	-	-
	" " 1201300.090	-	-	-	-	-	-	-	-	-	-	-
	WPA-Emergency 701082	-	23,318.84	48.77	213.11	-	201.26	23,781.98	-	23,781.98	4,673.82	28,455.80
	" " 201087-650999	-	22,717.90	-	-	1,064.79	-	23,782.69	-	23,782.69	5,147.95	28,930.64
	WPA-Administrative 701009	-	-	-	-	-	-	-	-	-	-	-
	" " 201088-650999	-	-	-	-	-	-	-	-	-	-	-
Total		-	46,036.74	48.77	213.11	1,064.79	201.26	47,564.67	-	47,564.67	9,821.77	57,386.44
Miscellaneous Supplies and Other Expenses	EQ-Regular 1291300.090	-	-	-	-	37.69	-	37.69	190.57	228.26	-	228.26
	" " 1201300.090	-	-	-	-	107.28	-	107.28	262.26	369.54	-	369.54
	WPA-Emergency 701082	207.73	3,868.12	210.76	126.67	1,296.23	-	5,709.51	3.83	5,713.34	3,032.53	8,745.87
	" " 201087-650999	-	677.91	-	2.00	3,853.48	-	4,533.39	7.85	4,541.24	995.34	5,536.58
	WPA-Administrative 701009	-	-	-	-	2,815.93	-	2,815.93	-	2,815.93	-	2,815.93
	" " 201088-650999	-	-	-	-	15.40	-	15.40	-	15.40	-	15.40
Total		207.73	4,546.03	210.76	128.67	8,126.01	-	13,219.20	464.51	13,683.71	4,027.87	17,711.58
Transportation and Travel	EQ-Regular 1291300.090	-	361.56	-	-	-	-	361.56	67.79	429.35	48.83	478.18
	" " 1201300.090	-	-	-	-	131.55	-	131.55	662.12	793.67	41.85	835.52
	WPA-Emergency 701082	538.99	3,628.74	591.98	650.86	559.94	91.94	6,062.45	92.09	6,154.54	1,575.03	7,729.57
	" " 201087-650999	605.99	2,898.20	15.07	144.13	559.36	312.16	4,534.91	99.74	4,634.65	1,396.32	6,030.97
	WPA-Administrative 701009	-	-	-	-	526.04	-	526.04	-	526.04	-	526.04
	" " 201088-650999	-	-	-	-	-	-	-	-	-	-	-
Total		1,144.98	6,888.50	607.05	794.99	1,776.89	404.10	11,616.51	921.74	12,538.25	3,062.03	15,600.28
Totals by Appropriation	EQ-Regular 1291300.090	1,641.66	2,185.59	3,000.00	3,056.25	9,207.55	-	19,091.05	8,586.91	27,677.96	4,260.59	31,938.55
	" " 1201300.090	3,150.00	2,218.33	1,555.00	1,949.28	7,273.11	487.59	16,633.31	9,039.11	25,672.42	3,825.60	29,498.02
	WPA-Emergency 701082	978.91	84,013.73	854.70	993.84	21,036.16	1,311.49	109,188.83	607.84	109,796.67	50,646.36	160,443.03
	" " 201087-650999	943.49	109,711.87	15.07	146.13	16,795.59	1,731.89	129,344.04	1,510.30	130,854.34	31,924.24	162,778.58
	WPA-Administrative 701009	-	-	-	-	9,762.98	-	9,762.98	-	9,762.98	-	9,762.98
	" " 201088-650999	-	-	-	-	2,713.65	-	2,713.65	-	2,713.65	-	2,713.65
Grand Totals		$ 6,714.06	$ 198,129.52	$ 5,424.77	$ 6,145.50	$ 66,889.04	$ 3,530.97	$286,733.86	$ 19,744.16	$ 306,478.02	$ 90,656.79	$ 397,134.81

* Accounting records maintained at Oakland office, but expenditures of Regular Funds apply to Northwestern Region as well as Sugar Pine Region

TABLE 10

ADJUSTED STATEMENT OF COST FOR THE SUGAR PINE REGION
RIBES ERADICATION PROJECT - 1939

Classification of Expenditures		Bureau of Entomology and Plant Quarantine Allotments		State WPA	Total all
		Sierra	Oregon	Oregon	Oregon
Salaries - Permanent Personnel		$ 6,512.88	$ 7,027.76	-	$ 7,027.76
Wages - Temporary Personnel		134,052.04	62,624.54	$20,020.61	82,645.15
Equipment		93.33	4,092.82	-	4,092.82
Subsistence Supplies		46,036.74	9,821.77	-	9,821.77
Other Supplies and Expenses		4,546.03	4,027.87	108.69	4,136.56
Transportation and Travel		6,888.50	3,062.03	536.38	3,598.41
Gross Distributed Expenditures		198,129.52	90,656.79	20,665.68	111,322.47
Plus	Twine Furnished from Stock	1,075.57	1,093.05	-	1,093.05
	Subsistence Supplies from Stock	3,145.33	1,024.31	-	1,024.31
	Depreciation on Equipment	5,869.59	2,515.54	-	2,515.54
Total Charges		208,220.01	95,289.69	20,665.68	115,955.37
Less	Non-Eradication Charges	-	-	-	-
	Salaries - Permanent Personnel	6,512.88	7,027.76	-	7,027.76
	Equipment	93.33	4,092.82	-	4,092.82
	Twine Returned to Stock	-	2,071.55	-	2,071.55
	Subsistence Supplies Returned	-	803.74	-	803.74
	Cost of Winter Camp Operations	9,407.86	2,075.13	-	2,075.13
Total Deductions		16,014.07	16,071.00	-	16,071.00
Net Cost - 1939 Operations		$192,205.94	$79,218.69	$20,665.68	$99,884.37

Agency	Cost of 1939 Operation	Number of Effective Man Days	Cost Per Effective Man Day
Bureau Sierra Operation	$192,205.94	31,544	$6.09
Bureau Oregon Operation	79,218.69	16,291	6.13

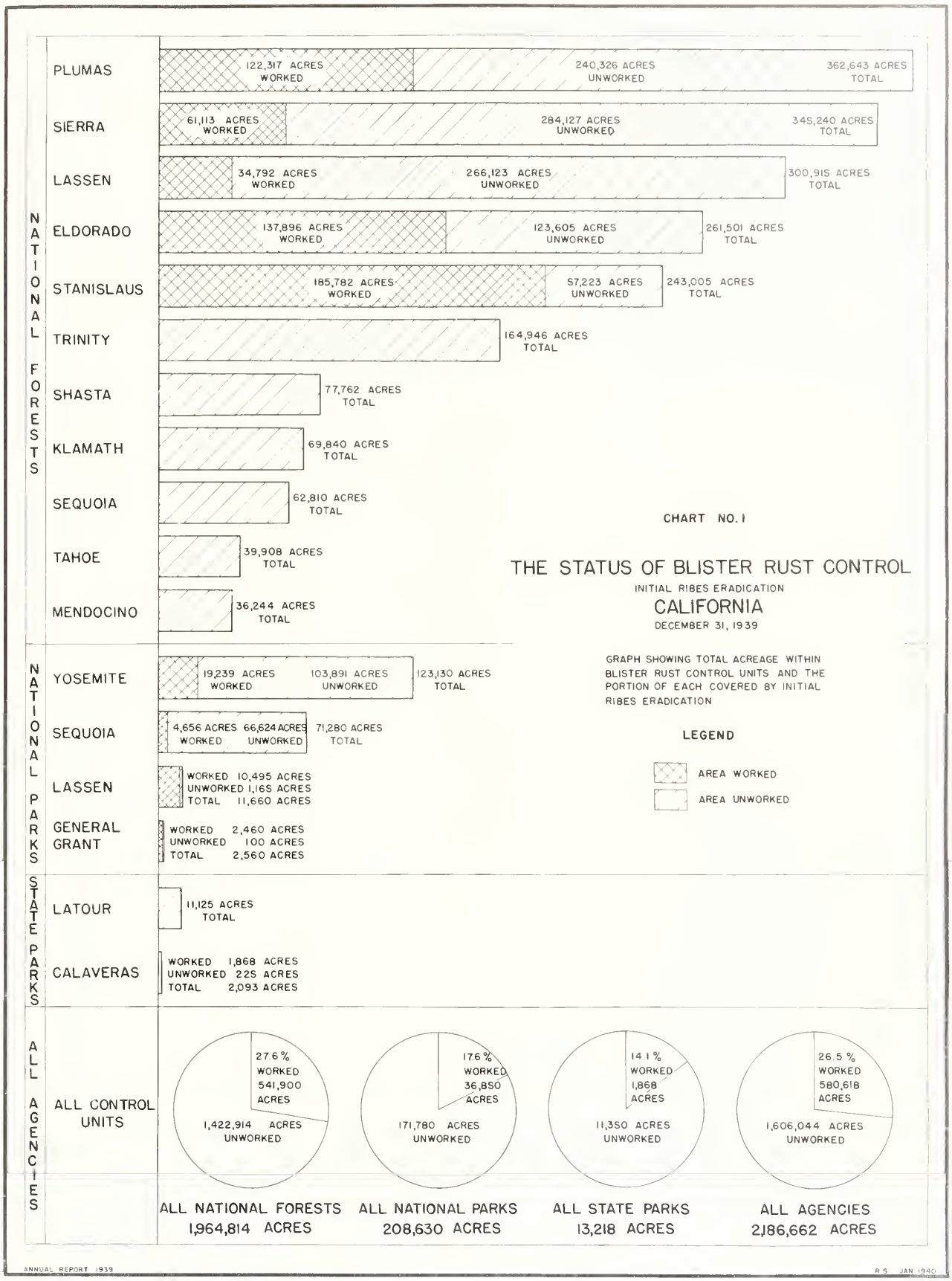


CHART NO. 1

THE STATUS OF BLISTER RUST CONTROL

INITIAL RIBES ERADICATION

CALIFORNIA

DECEMBER 31, 1939

GRAPH SHOWING TOTAL ACREAGE WITHIN BLISTER RUST CONTROL UNITS AND THE PORTION OF EACH COVERED BY INITIAL RIBES ERADICATION

LEGEND

AREA WORKED

AREA UNWORKED

ANNUAL REPORT 1939

R.S. JAN. 1940

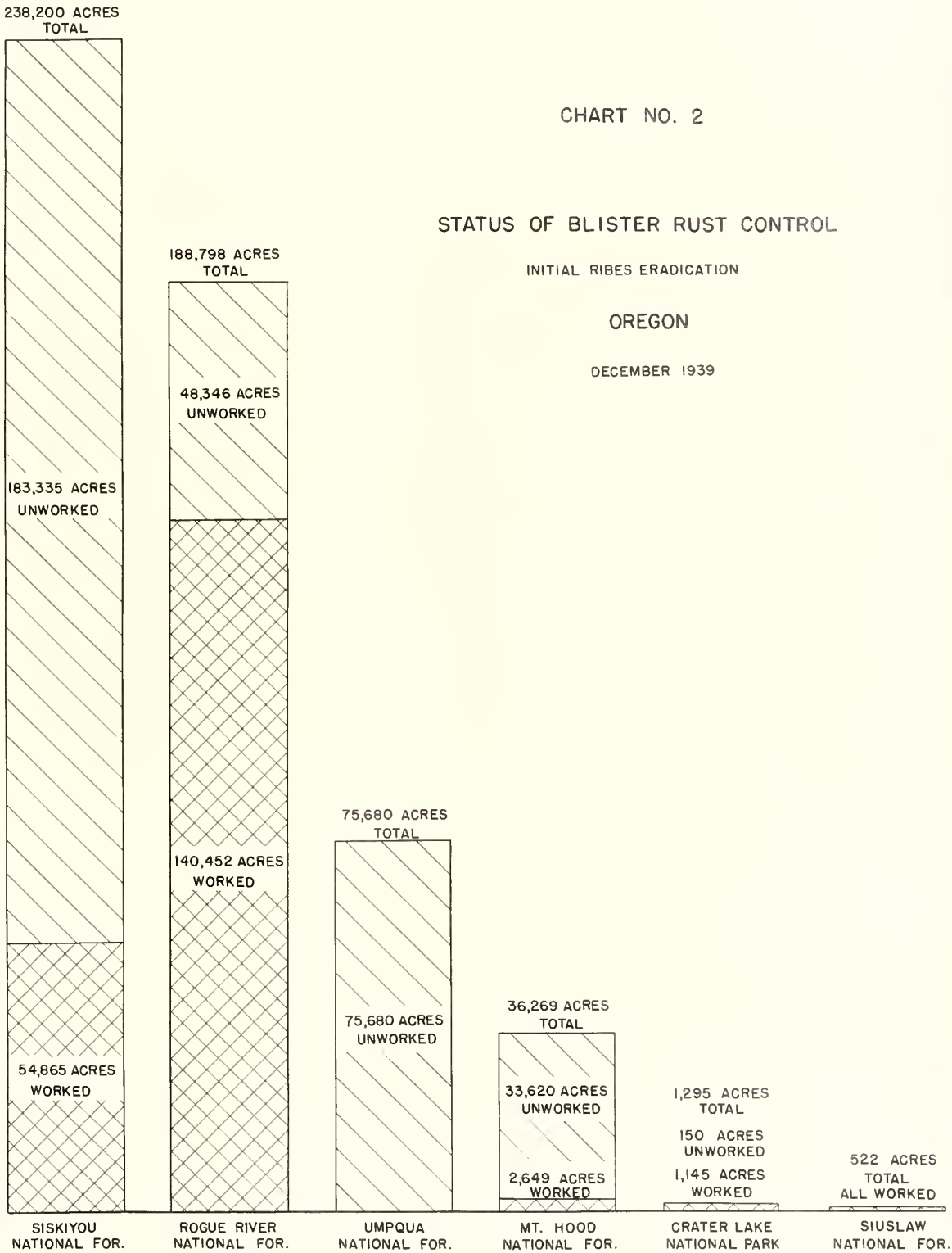
CHART NO. 2

STATUS OF BLISTER RUST CONTROL

INITIAL RIBES ERADICATION

OREGON

DECEMBER 1939



R.S. - H.E.G. JAN 1940

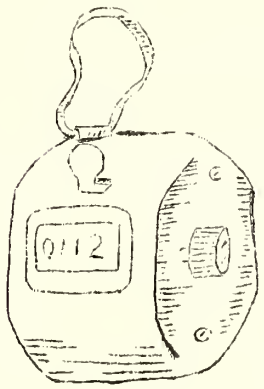
PART III - CHECKING

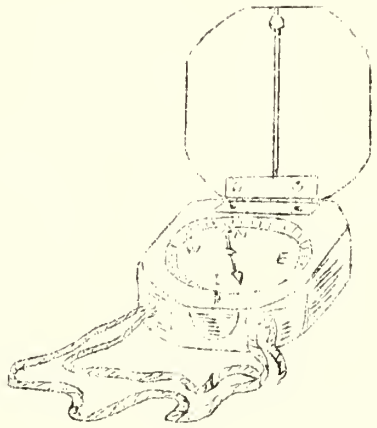
By

Carl W. Fowler, Assistant Forester,

and

S. Daryl Adams, Agent





INTRODUCTION

The checking program for 1939 was the largest of any year to date. While the area covered by advance check remained approximately the same as that of the previous year, there was a marked increase in the acreage covered by regular and post checks. It is inevitable, as the control program continues, that post checking will increase in volume and importance. It may be pointed out that in 1939 already three operations confined their work solely to reeradication.

ORGANIZATION AND ADMINISTRATION

The general organization of the checking personnel remained unchanged from that of previous years. The Bureau's regional checking supervisor, assisted by six full time checking supervisors, was responsible for all checking work and the direction of checkers hired by the three cooperating agencies: the Forest Service, the National Park Service, and the Bureau of Entomology and Plant Quarantine.

During the field season 111 checkers were employed in the Sugar Pine Region by the Forest Service, by the National Park Service, and by the Bureau. Included in this total were three checker foremen, three junior checker foremen, 25 senior checkers, and 80 junior checkers. Wage rates and grade classifications remained as established in 1938, namely: Junior Checker at $1440 per annum; Senior Checker at $1620 per annum; Junior Checker Foreman at $1800 per annum; and Checker Foreman at $2000 per annum.

The Forest Service CCC checkers of junior and senior grades were paid at these established rates. For the same grades the National Park Service paid 67 and 75 cents per hour, respectively. The total earnings of the individual Park checkers paid under this scale varied in proportion to the number of hours the checkers were permitted to work each month. Checker foremen and junior checker foremen were used extensively this season due to the large number of checkers employed. Their duties were to assist the checking supervisors in planning the checking work, to examine field work and records, and to maintain through strip retracements the desired standard of quality and reliability of the data.

A new phase of administration was initiated this year. As is common when several agencies are cooperating in a joint project there arises certain administrative difficulties. In the past the difficulties primarily involved in the administration of checking work were: (1) because the several projects do not start simultaneously, the assignment of the best qualified men to the jobs opening first is a near impossibility when each agency employes its own checkers; and (2) the need for freer movement of checkers between the camps of one agency and the camps of another. Such difficulties as these do not promote efficiency or quality in the field work and are highly undesirable. To alleviate these conditions an agreement was reached between the Forest Service and the Bureau whereby the Bureau hired all checkers needed for the combined projects, paid their salaries, and in turn was reimbursed by the Forest Service for checking work done on Federal land. Because of fiscal limitations the plan was not applicable to National Park Service or to Forest Service checkers paid from CCC funds, but it was a step toward the solution of these problems.

The delay in securing approval of this plan until the field season had begun resulted in some confusion and lost time. After the plan was in operation a short time, its advantages clearly justified the change. When the necessity arose on Forest Service and Bureau operations, checkers were transferred freely from camp to camp regardless of agency. As the end of the field season approached another advantage was apparent - the less capable checkers could be released first.

The assignment of the checking supervisors was as follows:

The Siskiyou, Klamath, and Rogue River National Forests to Lyle N. Anderson
The Lassen Volcanic National Park and Lassen National Forest to John C. Crowell
The Plumas National Forest to S. Daryl Adams
The Eldorado and Stanislaus National Forest to Carl W. Fowler
The Yosemite, Sequoia and General Grant National Parks and the northern Sierra National Forest to John N. Mitchell
The Bureau operation on the southern Sierra National Forest to Glenn J. Taylor.

CHECKING METHODS

Checking methods remained unchanged during 1939. All classes of checks were conducted as described in the 1939 checking manual. Departures from regular procedure were made throughout the field season to show definite additional information as desired by the operation supervisors. For example, on some operations all fruiting bushes were noted on the map, the so-called one foot bushes were measured and recorded to the nearest inch, bushes under six inches were recorded to the nearest one-tenth foot, and Ribes cereum was segregated and shown separately on the map.

The upland strip method of checking stream type and the sectional ground cover maps adopted in 1938 were continued during 1939.

A further decrease in the percentage of stream-type check in Oregon was made in 1939 with no apparent influence on the results and with a subsequent decrease in the checking cost per acre.

The everlasting task of keeping the standards of checking work at the point of highest accuracy continued to consume the greatest portion of the checking supervisor's time in the field. The system of rerunning original strips by the checking supervisor in the company of the checker was continued. The first-hand knowledge thus obtained has been found to give an excellent index of the quality of work being done.

DESCRIPTION OF CHECKING FIELD ACTIVITIES

California

Lassen National Forest

On the Lassen National Forest checking in the main was confined to advance and regular check on 1939 eradication areas. In addition, two small special projects were completed as follows: nine man-days were spent making a regular check on the Ribes-to-pine spread plots on the Shasta National Forest and twenty-four man-days were devoted to an extensive advance survey of the Colby Mountain unit on the Lassen National Forest

Plumas National Forest

Checking on the Plumas National Forest during 1939 included post and regular check on reeradication areas. No advance check was performed.

No separate post check camps were necessary since all the area checked was readily reached from the eradication camps. However, at times as many as twelve checkers and the checker foreman were working out of one camp. Fire fighting took a heavy toll of checkers' time on this operation, 17 percent of the total number of checker man-days being devoted to fire fighting.

D. L. Bliss Rubicon Point State Park

Two checkers were assigned to the D. L. Bliss Rubicon Point State Park for approximately three weeks to conduct an advance check on the Park and on a buffer zone of 20 chains around it. Thirty-one checker man-days were necessary to complete the job, which covered 1,830 acres.

The Park lies on the west shore of Lake Tahoe adjacent to Emerald and Meek's Bays. The area supports a notably aesthetic stand of sugar pine. The progress of checking was retarded because the area as a whole supports a dense ground cover of brush.

Eldorado National Forest

Checking activities on the Eldorado National Forest were post and regular checks on reeradicated areas with post check occupying the greater portion of the time. In addition to post check being conducted on 1939 reeradicated areas worked initially in 1934, a considerable area to be worked next season was covered. The post checking of the 1940 reeradication areas was made possible by the establishment of a separate post check camp by the Forest Service in the Caldor Unit on the southern part of the forest. The party was organized July 12 and work continued until September 19. Camp personnel consisted of one cook, six checkers, and a junior checker foreman. Of the 22,167 acres checked, 19,606 acres were post checked and 2,561 acres advance checked. The advance and the post check areas formed a solid block. The obtaining of this information a year prior to the actual eradication job will facilitate the preparation of a work plan for the following year.

Stanislaus National Forest

During the latter part of May a post check camp was organized on the Beaver Creek Unit to check areas worked initially in 1934. The personnel consisted of one cook and five checkers under the supervision of a senior checker. The camp operated approximately one month and was closed at the end of the fiscal year because of lack of funds.

Checking on the Stanislaus National Forest during the remainder of the season was conducted from the established eradication camps and consisted of post and regular check on reeradication areas.

Sierra National Forest

Checking on the Sierra National Forest was divided into two separate units: (1) the Bureau's project on the southern end of the forest, and (2) the Forest Service project located in the northern portion. Two checking supervisors acting independently were responsible for checking activities.

Since no previous work had been done on the southern unit, and considering the large size of the operation, the advance check on 1939 eradication areas was a large scale project. Regular check was conducted in conjunction with the advance check as eradication work progressed.

The establishment of reference corners in lieu of section corners in unsurveyed townships, the location of original corners in other townships, and the irregular size and shape of sections necessitated staff compass and chaining control to be performed in connection with the checking. This control is necessary in conducting the field work and in preparing accurate permanent maps.

Post and regular check was carried out from the Forest Service camps in the northern part of the forest. Approximately 1,000 acres of post check reserve was accomplished in addition to the current checking.

Lassen Volcanic National Park

In the Lassen Volcanic National Park, where the aesthetic value of the white pine stands is the important factor in determining the priority of areas in blister rust control work, there remained early in 1939 only two areas in need of advance check. The White Mountain area consists of approximately 6,000 acres lying along the Lassen Park Loop Highway, and the Twin Lakes area of 12,000 acres in the eastern part of the Park extending from Twin Lakes to Juniper Lake. The checkers worked out of the Park CCC camps and for a short time established a separate camp in order to conveniently reach the southern portion of the Twin Lakes area. The advance check on these two areas and the regular check on the 1939 eradication areas were completed by October 1.

Yosemite, Sequoia, and General Grant National Parks

On the southern national parks checking progressed with the expanded eradication program. Compared with the checking program of 1938 proportionately more time was spent on regular check than on advance check.

All current advance, post, and regular check was completed in Yosemite National Park. In addition, approximately 20,000 acres of advance check reserve was built up to aid in the planning and execution of future Ribes eradication work. In conjunction with the checking work CCC enrollees were trained to run staff compass and chaining control for all sections and quarter-section lines, thereby facilitating the checking work and aiding the eradication personnel.

Advance and regular checks were continued on Sequoia National Park. The checker for the General Grant project was shared with Sequoia National Park. All advance checking involved in General Grant National Park and the protective strip was completed, plus the current regular check.

Oregon

Checking in Oregon was conducted on the Siskiyou, Klamath, and Rogue River National Forests and Crater Lake National Park. A project in Washington on the Columbia National Forest was completed by the Oregon checking personnel.

The Siskiyou National Forest job was the largest, single checking assignment ever conducted in Oregon. It was primarily an advance check project as sixty-five percent of the area blocked out. Considerable difficulty was encountered in attempting to keep ahead of the eradication crews. This was due in part to the lack of available checkers at the beginning of the season and to the general character of the area itself.

Advance, post, and regular check was conducted on the Rogue River National Forest. All 1935 and 1936 eradication areas on the Upper Rogue unit were post checked this season.

The advance check on the Cloud Cap extension in the Crater Lake National Park was completed. Since it was an unsurveyed area it was necessary to run base lines and to sectionize it. Base lines were run with staff compass, chain and Abney hand level. It was impossible to complete the check on parts of Mt. Scott, an 8,938 foot peak in the southern end of the area owing to cliffs, but all timbered and vegetated parts were covered.

On the Klamath National Forest one checker was employed for one month, where he advance checked 2,175 acres. The eradication crews covered only 320 acres, thereby leaving sufficient area for one camp to work on next season until additional advance checking is done.

The Wind River Nursery and Arboretum located near Carson, Washington, had been worked in 1930 and 1931 and had never been given a systematic check; therefore, at the request of the Pacific Northwest Forest and Range Experiment Station a post check was made in May by three Oregon checkers. A block of 1,440 acres including an ample buffer strip around the nursery was post checked and subsequently regular checked after the reeradication work.

WORK PERFORMED AND RESULTS OBTAINED

Explanation of Tables

Table 1 gives the standards of control for Ribes eradication. Tables 2 and 3 present analytic results of checking and are explained in detail under "Analysis and Discussion of Results".

The results for all classes of checking are presented in Tables 4 to 8, inclusive. Tables 4, 5, and 8 give a summary and analysis of regular checking results; Table 6 summarizes advance and post checking; and Table 7 gives the cost of all classes of checking and the daily output.

In Table 4 under the heading "Acres Covered by Final Check" is shown the number of acres on which a final regular check was performed. In the adjacent column appear the acres on which Ribes eradication work was done but on which no final check was performed. Areas that were reworked but not rechecked are included in this column. The percentage of check was computed by dividing the acres in check strips by the acres covered by final check. Included under "Man Days" are all man-days actually spent running check strips and proportional amounts of training, travel, office, and checker foreman time. The total number of man-days spent on training, travel, office, and supervision (checker foremen) was prorated to the three classes of checking in proportion to the number of man-days of field work done in each class. The time of the checking supervisors, annual and sick leave, and off-duty time of the checkers is not included in this report.

The number of acres conforming to the five control standards are also shown in Table 4. A description of these five standards and the areas to which they apply follows.

TABLE 1

STANDARDS OF CONTROL FOR RIBES ERADICATION

Number of Ribes Population Class	Ribes Population Classes	Common Name of Class	Normal Occurrence of Seedlings	Control Standards
1	0 to 25 F.L.S.	Ribes-free	Absent	(Ribes eradication work unnecessary; sufficient natural suppression exists.)
2	26 F.L.S. to 30 bushes	Light	Absent or Rare	Reduce to 8 F.L.S. or less per acre.
3	31 bushes to 150 bushes	Medium	Absent to Occasional	Reduce to 16 F.L.S. or less per acre.
4	151 bushes to 1,000 bushes	Heavy	Occasional	Reduce to 25 F.L.S. or less per acre.
5	Over 1,000 bushes	Very Heavy	Numerous	Leave no individual bush of over 25 F.L.S.

Acreage meeting control standard No. 1 on post check is eliminated from reeradication crew work, but is not claimed in this report. (See Table 3 in Eradication Report entitled "Summary of Ribes Eradication by Operations").

Table 5 is an analysis of the acreage which did not meet the standards of control. In compiling these data the 40-acre block was taken as the basic plot to which the Ribes data were applied. If, however, a 40-acre block failed to meet the control standard due to numerous Ribes bushes in one half of it, only the 20-acre block supporting the majority of the Ribes was delimited. The per acre results were computed from the data shown on the final regular checking maps.

A summary of advance and post checking results is given in Table 6. The total number of acres to which the sample applies is shown in the columns headed "Acres Covered." On areas where a check less than five per-cent was sufficient to establish the population classes, all the acres in the section were claimed. "Man-days" includes all time actually spent running strips and proportional amounts of office, training, travel, and checker foreman time. Included in the report for Rogue River National Forest are 2,175 acres and 25 man-days spent on advance checking on the Klamath National Forest and 1,440 acres and 27-5/8 man-days spent on post checking on the Columbia Wind River Nursery.

Table 7 presents the results attained per man-day and the cost of checking. In the column headed "Effective Man-Days" the figures for all classes of checking were taken from Tables 4 and 6; the man-days spent on

"Eradication" and "Fire" were taken from the checkers' time summaries. "Strip Acres" includes the total acreage of all strips. In the case of regular checking all strip acres covered on first check and subsequent rechecks are included. "Strip Acres per Checker Field Man-Day" were computed on the basis of days actually spent on check strips.

The "Total Cost" for each operation includes the gross salaries of all checkers and checker foremen and the cost of operating all pick-ups (at four cents per mile) that were used on the checking project. On the Eldorado and Stanislaus operations special checking camps were established, necessitating the employment of two cooks. These additional costs, amounting to $248.41 for the Eldorado and $114.00 for the Stanislaus, are included in the total cost for each of these operations.

From the total cost of each operation the cost for each "Activity" was computed by applying the "Percent of Total" shown under "Effective Man-Days." The "Cost per Acre Basis of Acres Covered by Check" was computed from the cost figure in the preceding column and the acreage figures in Tables 4 and 6.

Table 8 is an analysis of all regular checking. The "Man-Days" and "Total Cost" figures under "All Regular Checks" were obtained from Table 7. The acreage for first check includes all acres on which a first check was performed. Since a number of areas received a first check but not a final regular check, this figure exceeds the figure in Table 4 under "Acres Covered by Final Check."

Analysis and Discussion of Results

Tables 4 and 5. Of the total area of 155,713 acres worked by eradication crews in 1939 in the Sugar Pine Region, 89.3 percent, or 138,962 acres received a final regular check. The 10.7 percent, or 16,751 acres unchecked was due to such field conditions as: (1) the early defoliation of Ribes bushes on many areas making checking impracticable, (2) inclement weather at the end of the field season, (3) the continued operation of eradication camps during the late fall when checking is not fully reliable and (4) the fact that checking activities cease when a camp is closed making it impossible to obtain a check on all areas worked. A portion of the unchecked area includes areas that received a first regular check and that were subsequently reworked but not rechecked for any of the foregoing reasons. In addition to areas receiving a regular check, 46,429 acres met control standards without crew work from advance check, and 28,974 were eliminated from crew work by post check. Therefore, the total area having a final check was 214,365 acres.

On the following page, Table 2 gives the acreage and percentage of the total acres receiving a final check of each Ribes population class and the acreage and percentage of each class that meets or does not meet control standards.

TABLE 2

AN ANALYSIS OF AREA COVERED BY FINAL CHECK

Ribes Population Class		Acres In Each Class	Percent of Total Area	Area Meeting Control Standards		Area Not Meeting Control Standards	
				Acres	Percent of Class Total	Acres	Percent of Class Total
Area Eliminated from Crew Work							
By Advance Check	1	46,429	21.7	46,429	100.0	-	-
By Post Check	1	28,974	13.5	28,974	100.0	-	-
Total	1	75,403	35.2	75,403	100.0	-	-
Area Worked by Eradication Crews	2	76,996	35.9	70,660	91.8	6,336	8.2
	3	34,152	15.9	28,315	82.9	5,837	17.1
	4	11,234	5.2	7,895	70.3	3,339	29.7
	5	16,580	7.7	15,252	92.0	1,328	8.0
	Total	138,962	64.8	122,122	87.9	16,840	12.1
Total Area Claimed By Eradication		214,365	100.0	197,525	92.1	16,840	7.9

As revealed by the preceding table it is significant to note that 71 percent of the total area receiving a final check was found to be in Ribes population classes 1 and 2, those areas sufficiently Ribes-free to meet control standards without crew work and those areas supporting a light Ribes population. This high percentage in classes 1 and 2 may be attributed to the increased amount of reeradication work performed and to the working of a large unit in Oregon which supports a light Ribes population.

The 75,403 acres in population class 1 represents the Ribes-free areas; hence, by definition, 100 percent of the acreage in this class met control standards. Of the 138,962 acres worked by eradication crews, 88 percent met control standards, and for the total 214,365 acres checked, 92 percent met control standards. An examination of the percentages of areas not meeting control standards show that the higher percentages occur in classes 3 and 4. These differences may be due to the character of the areas themselves and to the present method of eradication used on them. It is significant to mention that a similar distribution occurred for 1938. For this reason it might be worthwhile to investigate the reasons for these higher percentages in classes 3 and 4.

Table 3 gives an analysis of Ribes bushes found on first regular check.

On the 143,560 acres included in this Table the majority of the bushes found were one foot bushes. Eighty-one percent of the total bushes were less than six feet of live stem in size, but accounted for only 26 percent of the total live stem; the remaining 19 percent exceeding six feet of live stem in size made up 74 percent of the total live stem.

Table 6. In round numbers, 173,000 acres were advance checked and 152,000 acres post checked in 1939. To complete the check or to satisfy eradication requirements the percentage of check for advance check averaged 4.0 percent as against the average of 3.9 percent for post check. The rather high percentage of check for advance check this year resulted from the type of area checked. Areas supporting light Ribes populations require a higher percentage of check than areas supporting heavier populations.

As indicated from previous data the output per checker man-day measured in strip acres has been greater for post check than for advance check. The data for 1939 however, reverse this condition: whereas in 1938 the strip acres per checker man-day were 2.8 for post check and 2.4 for advance check, in 1939 they were 2.6 for post check and 3.3 for advance check. The most evident reason for this reversal is that the rate of travel on advance check strips on the Siskiyou operation in Oregon and on the Lassen Volcanic Park and Lassen Forest operations in California was noticeably above normal, which was in turn due to the scarcity of Ribes on those operations and to the relatively open character of large parts of the areas. On none of these three operations was any post checking performed.

Table 7. A glance at this table will reveal a disparity in output and cost of checking among the several operations. Such factors as output and cost are inevitably due for comparison and rightly so, but a word of

explanation is necessary.

In applying a measure to the efficiency (output or cost) or a particular checking job all variable influencing factors must be considered. Checking production and subsequently all types of checking costs are influenced by many variable field conditions some of which are: topography, ground cover, accessibility of the areas to be checked, and the Ribes population on these areas. In addition, the cost of checking is influenced by rates of pay, percent of check, cost of transportation, and the additional supervision needed. The amount of recheck is an important item affecting the cost of regular checking. Consideration of these variables will explain most of the differences among the figures and will assist in making a better comparision between operations.

The average cost of an effective checker man-day in the Sugar Pine Region in 1939 was $6.24.

Table 8. The 45,000 acres of recheck represents 32 percent of the total acreage receiving a first check. This percentage is an increase of six percent over that for rechecking in 1937 and 1938. This increase may be attributed partially to the expanded reeradication program. On reeradication program. On reeradication areas a higher percentage of area falls within the light Ribes population class which means a more rigid standard of control must be met. To meet these higher control standards more rework is necessary.

Rechecks cost 1.1 cents or nine percent more per acre than first checks. The fact that rechecks are more expensive than first checks has been long established and is explained by the fact that recheck blocks are frequently small and isolated, necessitating a high proportion of travel time in relation to the time actually spent on check strips. The cost of regular checking in the Sugar Pine Region in 1939 was 12.5 cents per acre.

CONCLUSION

The checking program in the Sugar Pine Region represents an ever changing set of conditions that must be met by newer methods and changing policies. Thus, during the 1939 season an effort was made in this direction by the change in the administrative policy whereby the checkers were hired, paid and released by the Bureau, which in turn was reimbursed by the Forest Service for services received. This plan proved its workability and the results vindicated the change. It is desirable that this unifying policy be amplified to include all checkers employed in the entire region.

As the control program continues and expands, the need for more advance and post checking prior to the working season becomes more acute. When checking and eradication work start simultaneously, the checking organization is faced with difficulties such as a shortage of checkers at the beginning of the season, inexperienced men who must be trained, and the immediate need of data by the eradication personnel. These factors not only place a strain on the checkers but hinder the eradication personnel in the planning and execution of the project. Efforts were made during the season of 1939 to build up reserves of advance information, and the expansion of this policy will make for a more efficient control program in the future.

TABLE 3

AN ANALYSIS OF RIBES BUSHES FOUND ON FIRST REGULAR CHECK

Bush Size in Feet of Live Stem		Initial Eradication		Re-eradication		All Working	
		Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
1	Bushes	12,394	51.8	7,650	52.5	20,044	52.1
	FLS	12,394	8.6	7,650	13.1	20,044	9.9
2 - 5	Bushes	6,491	27.1	4,539	31.2	11,030	28.7
	FLS	19,465	13.5	13,236	22.6	32,701	16.1
6 - 10	Bushes	2,173	9.1	1,206	8.2	3,379	8.8
	FLS	16,791	11.6	9,170	15.7	25,961	12.8
11 - 15	Bushes	888	3.7	448	3.1	1,336	3.5
	FLS	11,423	7.9	5,667	9.7	17,090	8.4
16 - 20	Bushes	547	2.3	257	1.8	804	2.1
	FLS	9,804	6.8	4,558	7.8	14,362	7.1
21 - 25	Bushes	379	1.6	157	1.1	536	1.4
	FLS	8,908	6.2	3,674	6.3	12,582	6.2
Over 25	Bushes	1,044	4.4	303	2.1	1,347	3.4
	FLS	65,651	45.4	14,512	24.8	80,163	39.5
Total	Bushes	23,916	100.0	14,560	100.0	38,476	100.0
	FLS	144,436	100.0	58,467	100.0	202,903	100.0
Strip Acres		3,785.2		3,264.7		7,049.9	
Acres Covered		74,965		68,595		143,560	

TABLE 4

SUMMARY OF REGULAR CHECKING IN THE SUGAR PINE REGION - 1939

Operation	Acres Covered by Final Check	Acres Unchecked	Percent of Check	Man Days	Acres Meeting Control Standards				
					*No. 1	No. 2	No. 3	No. 4	No. 5
OREGON									
Rogue River Nat'l Forest	8,536	75	5.0	210	2,375	3,226	1,126	154	1,398
Siskiyou National Forest	18,387	139	5.6	469 7/8	36,089	14,862	1,835	439	25
Total - - - - - -	26,923	212	5.4	679 7/8	38,464	18,088	2,961	593	1,423
CALIFORNIA									
Lassen National Forest	6,623	2,155	5.0	129 6/8	1,399	2,517	1,740	450	1,538
Plumas National Forest	15,177	3,039	5.0	450	1,344	9,473	3,397	632	1,095
Eldorado National Forest	20,195	3,030	4.9	699 1/8	-	13,889	3,514	200	585
Stanislaus Nat'l Forest	15,984	3,926	4.7	420 2/8	-	11,547	2,255	150	159
Sierra National Forest									
(Bureau	23,018	3,860	4.9	663 2/8	-	5,918	7,898	660	5,498
(Forest Service	9,588	160	4.8	158	-	1,299	1,663	1,911	3,240
Lassen Volcanic National Park	2,022	-	4.8	34 4/8	3,740	1,593	349	40	-
Yosemite National Park	14,210	278	5.0	397 6/8	1,482	3,851	3,692	2,582	1,572
General Grant National Park	627	30	5.0	16 3/8	-	-	30	-	-
Sequoia National Park	4,595	61	5.1	134 5/8	-	2,435	816	677	142
Total - - - - - -	112,039	16,539	4.9	3,103 5/8	7,965	52,572	25,354	7,302	13,829
GRAND TOTAL									
Sugar Pine Region	138,962	16,751	5.0	3,783 4/8	46,429	70,660	28,315	7,895	15,252

* This column represents the acreage eliminated from crew work by advance check but not that eliminated by post check.

TABLE 5

ANALYSIS OF AREAS NOT MEETING THE CONTROL STANDARDS - 1959

Operation	Acreage Not Meeting Control Standards											
	Control Standard No. 2			Control Standard No. 3			Control Standard No. 4			Control Standard No. 5		
	Acres	Per Acre		Acres	Per Acre		Acres	Per Acre		Acres	Per Acre	
		Bush	F.L.S.		Bush	F.L.S.		Bush	F.L.S.		Bush	F.L.S.
OREGON												
Rogue River Nat'l Forest	592	7.3	41	790	11.1	77	1,160	15.2	62	90	27.6	267
Siskiyou National Forest	1,048	2.5	38	122	7.9	65	56	22.7	324	-	-	-
Total - - - - - - -	1,640	4.0	39	912	10.4	75	1,216	15.9	88	90	27.6	267
CALIFORNIA												
Lassen National Forest	45	2.6	71	118	8.5	49	175	13.0	134	40	1.5	26
Plumas National Forest	456	4.2	14	40	5.3	22	84	13.1	35	-	-	-
Eldorado National Forest	1,150	4.4	16	817	7.4	27	-	-	-	40	21.5	64
Stanislaus Nat'l Forest	839	4.3	25	966	9.7	43	-	-	-	68	11.2	78
Sierra National Forest (Bureau	748	5.0	31	1,821	10.2	45	244	14.4	48	231	31.3	88
(Forest Service	370	10.3	59	364	11.4	46	376	17.2	56	365	57.2	141
Lassen Volcanic National Park	-	-	-	-	-	-	-	-	-	40	8.5	69
Yosemite National Park	775	6.2	97	529	8.6	74	1,006	8.1	54	203	15.2	116
General Grant National Park	-	-	-	188	11.0	116	218	24.7	171	191	24.9	91
Sequoia National Park	313	6.3	25	82	7.6	21	20	5.0	45	60	4.3	132
Total - - - - - - -	4,696	5.3	37	4,925	9.4	46	2,123	12.9	66	1,238	30.2	104
GRAND TOTAL												
Sugar Pine Region	6,336	5.0	38	5,837	9.6	50	3,389	13.9	74	1,328	30.0	115

TABLE 6

SUMMARY OF ADVANCE AND POST CHECKING IN THE SUGAR PINE REGION - 1939

Operation	Advance Check			Post Check		
	Acres Covered	Percent of Check	Man Days	Acres Covered	Percent of Check	Man Days
OREGON						
Rogue River Nat'l Forest	8,204	4.0	104 5/8	18,277	5.0	271 3/8
Siskiyou National Forest	53,450	5.7	794 5/8	-	-	-
Crater Lake Nat'l Park	2,389	4.9	17 4/8	-	-	-
Total - - - - - -	64,043	5.4	916 6/8	18,277	5.0	271 3/8
CALIFORNIA						
Lassen National Forest	18,432	3.3	173 7/8	-	-	-
Plumas National Forest	-	-	-	52,877	4.0	869 5/8
Eldorado National Forest	2,761	3.0	35 3/8	45,180	3.4	728 2/8
Stanislaus Nat'l Forest	-	-	-	21,494	3.6	318
Sierra National Forest (Bureau	35,540	2.9	426 5/8	-	-	-
(Forest Service	-	-	-	5,536	4.4	79
Lassen Volcanic National Park	19,066	3.6	175 7/8	-	-	-
D. L. Bliss State Park	1,830	3.7	31	-	-	-
Yosemite National Park	26,262	3.3	365 7/8	8,850	4.6	181 3/8
General Grant Nat'l Park	1,632	1.9	17 5/8	-	-	-
Sequoia National Park	2,998	2.5	58 4/8	-	-	-
Total - - - - - -	108,521	3.2	1,284 6/8	133,937	3.8	2,176 2/8
GRAND TOTAL						
Sugar Pine Region	172,564	4.0	2,201 4/8	152,214	3.9	2,447 5/8

TABLE 7

ACRES CHECKED PER MAN DAY AND COST OF CHECKING IN THE SUGAR PINE REGION - 1939

Operation	Activity	Effective Man Days		Strip Acres	*Strip Acres Per Checker Man Day	Strip Acres Per Checker Field Man Day	Total Cost	Cost Per Acre Basis of Acres Covered by Check	Cost Per Strip Acre
		Number	Percent of Total						
OREGON									
Rogue River National Forest	Regular Checking	210	33.1	596.2	2.8	3.4	$ 1,254.38	$0.147	$2.10
	Advance Checking	104 5/8	16.5	326.9	3.1	3.7	624.92	.076	1.91
	Post Checking	271 3/8	42.7	916.7	3.4	4.0	1,620.96	.089	1.77
	Eradication	45 4/8	7.2	-	-	-	271.79	-	-
	Fire	3 4/8	0.5	-	-	-	20.91	-	-
	Total - - -	635	100.0	1,839.6	-	-	3,792.96	-	-
Siskiyou National Forest	Regular Checking	469 7/8	36.9	1,299.5	2.9	3.3	2,806.65	.153	2.16
	Advance Checking	794 5/8	62.4	3,039.8	4.0	4.6	4,746.47	.089	1.56
	Eradication	9 3/8	0.7	-	-	-	55.97	-	-
	Total - - -	1,273 7/8	100.0	4,339.3	-	-	7,609.09	-	-
Crater Lake National Park	Advance Checking	17 4/8	100.0	117.8	6.7	7.1	104.53	.044	0.89
Total	Regular Checking	679 7/8	35.3	1,895.7	2.9	3.3	4,061.03	.151	2.14
	Advance Checking	916 6/8	47.6	3,484.5	4.0	4.5	5,475.92	.086	1.57
	Post Checking	271 3/8	14.1	916.7	3.4	4.0	1,620.96	.089	1.77
	Eradication	54 7/8	2.8	-	-	-	327.76	-	-
	Fire	3 4/8	0.2	-	-	-	20.91	-	-
	Total - - -	1,926 3/8	100.0	6,296.9	-	-	$11,506.58	-	-

* On the basis of total man days, exclusive of checker foreman.

TABLE 7 (CONTINUED)

ACRES CHECKED PER MAN DAY AND COST OF CHECKING IN THE SUGAR PINE REGION - 1939

Operation	Activity	Effective Man Days		Strip Acres	*Strip Acres Per Checker Man Day	Strip Acres Per Checker Field Man Day	Total Cost	Cost Per Acre Basis of Acres Covered by Check	Cost Per Strip Acre
		Number	Percent of Total						
CALIFORNIA									
Lassen National Forest	Regular Checking	129 6/8	26.2	447.1	3.5	3.7	$ 867.22	$0.131	$1.94
	Advance Checking	173 7/8	35.1	604.5	3.5	3.8	1,161.81	.063	1.92
	Eradication	112 5/8	22.8	-	-	-	754.68	-	-
	Fire	78 4/8	15.9	-	-	-	526.29	-	-
	Total - - -	494 6/8	100.0	1,051.6	-	-	3,310.00	-	-
Plumas National Forest	Regular Checking	450	27.6	1,051.4	2.5	2.7	2,785.03	.184	2.65
	Post Checking	869 5/8	53.3	2,096.7	2.6	2.8	5,382.30	.102	2.57
	Eradication	36	2.2	-	-	-	223.09	-	-
	Fire	275 2/8	16.9	-	-	-	1,703.93	-	-
	Total - - -	1,630 7/8	100.0	3,148.1	-	-	10,094.35	-	-
Eldorado National Forest	Regular Checking	699 1/8	46.8	1,453.1	2.3	2.7	4,335.22	.215	2.98
	Advance Checking	35 3/8	2.4	82.9	2.6	3.0	222.32	.081	2.68
	Post Checking	728 2/8	48.8	1,531.2	2.3	2.7	4,520.49	.100	2.95
	Eradication	11 2/8	0.8	-	-	-	74.11	-	-
	Fire	18 3/8	1.2	-	-	-	111.16	-	-
	Total - - -	1,492 3/8	100.0	3,067.2	-	-	9,263.30	-	-
Stanislaus National Forest	Regular Checking	420 2/8	55.8	1,041.7	2.5	3.0	2,631.53	.165	2.53
	Post Checking	318	42.3	770.8	2.5	2.9	1,994.87	.093	2.59
	Eradication	3 1/8	0.4	-	-	-	18.86	-	-
	Fire	11 4/8	1.5	-	-	-	70.74	-	-
	Total - - -	752 7/8	100.0	1,812.5	-	-	$ 4,716.00	-	-

* On the basis of total man days, exclusive of checker foreman.

TABLE 7 (CONTINUED)

ACRES CHECKED PER MAN DAY AND COST OF CHECKING IN THE SUGAR PINE REGION - 1939

Operation	Activity	Effective Man Days		Strip Acres	*Strip Acres Per Checker Man Day	Strip Acres Per Checker Field Man Day	Total Cost	Cost Per Acre Basis of Acres Covered by Check	Cost Per Strip Acre
		Number	Percent of Total						
CALIFORNIA									
Sierra National Forest (Bureau)	Regular Checking	663 2/8	60.6	1,652.4	2.7	3.1	$ 4,269.13	$0.185	$2.58
	Advance Checking	426 5/8	39.0	1,023.2	2.6	3.0	2,745.91	.077	2.68
	Eradication	1	0.1	-	-	-	6.44	-	-
	Fire	3 2/8	0.3	-	-	-	21.13	-	-
	Total - - -	1,094 1/8	100.0	2,675.6	-	-	7,042.61	-	-
Sierra National Forest (Forest Service)	Regular Checking	158	56.4	487.7	3.1	3.8	1,032.39	.108	2.12
	Post Checking	79	28.2	241.3	3.1	3.7	516.10	.093	2.14
	Eradication	28	10.0	-	-	-	182.95	-	-
	Fire	15	5.4	-	-	-	98.06	-	-
	Total	280	100.0	729.0	-	-	1,829.50	-	-
Lassen Volcanic National Park	Regular Checking	34 4/8	14.5	154.2	3.9	4.6	217.50	.108	1.62
	Advance Checking	175 7/8	74.1	691.9	3.9	4.7	1,111.50	.055	1.61
	Eradication	27 1/8	11.4	-	-	-	171.00	-	-
	Total - - -	237 4/8	100.0	826.1	-	-	1,500.00	-	-
D. L. Bliss State Park	Advance Checking	31	100.0	67.0	2.2	2.2	184.00	.101	2.75
Yosemite National Park	Regular Checking	397 6/8	36.2	955.3	2.9	3.2	2,462.50	.173	2.58
	Advance Checking	365 7/8	33.3	859.7	2.8	3.2	2,265.87	.086	2.64
	Post Checking	181 3/8	16.5	407.7	2.7	3.0	1,122.73	.127	2.75
	Eradication	152	13.8	-	-	-	941.05	-	-
	Fire	2	0.2	-	-	-	12.25	-	-
	Total - - -	1,099	100.0	2,223.2	-	-	$ 6,804.40	-	-

* On the basis of total man days, exclusive of checker foreman.

TABLE 7 (CONTINUED)

ACRES CHECKED PER MAN DAY AND COST OF CHECKING IN THE SUGAR PINE REGION - 1939

Operation	Activity	Effective Man Days		Strip Acres	*Strip Acres Per Checker Man Day	Strip Acres Per Checker Field Man Day	Total Cost	Cost Per Acre Basis of Acres Covered by Check	Cost Per Strip Acre
		Number	Percent of Total						
CALIFORNIA									
General Grant National Park	Regular Checking	16 3/8	29.2	31.2	1.9	2.7	$ 112.88	$0.180	$3.62
	Advance Checking	17 5/8	31.5	31.5	1.8	2.5	121.48	.074	3.86
	Eradication	22	39.3	-	-	-	151.64	-	-
	Total - - -	56	100.0	62.7	-	-	386.00	-	-
Sequoia National Park	Regular Checking	134 5/8	52.2	274.2	2.0	3.4	885.04	.193	3.23
	Advance Checking	58 4/8	22.7	75.4	1.3	2.2	384.56	.128	5.16
	Eradication	59 7/8	23.2	-	-	-	393.69	-	-
	Fire	5	1.9	-	-	-	32.91	-	-
	Total - - -	258	100.0	349.6	-	-	1,696.20	-	-
TOTAL									
All California	Regular Checking	3,103 5/8	41.8	7,528.8	2.6	3.0	19,598.44	.175	2.60
	Advance Checking	1,284 6/8	17.3	3,436.1	2.9	3.5	8,197.45	.076	2.39
	Post Checking	2,176 2/8	29.3	5,047.7	2.5	2.8	13,536.49	.101	2.68
	Eradication	453	6.1	-	-	-	2,917.51	-	-
	Fire	408 7/8	5.5	-	-	-	2,576.47	-	-
	Total - - -	7,426 4/8	100.0	16,012.6	-	-	46,826.36	-	-
GRAND TOTAL - SUGAR PINE REGION									
California and Oregon	Regular Checking	3,783 4/8	40.5	9,424.5	2.7	3.1	23,659.47	.170	2.51
	Advance Checking	2,201 4/8	23.5	6,920.6	3.3	3.8	13,673.37	.079	1.98
	Post Checking	2,447 5/8	26.2	5,964.4	2.6	2.9	15,157.45	.100	2.54
	All Checking	8,432 5/8	90.2	22,309.5	2.8	3.2	52,490.29	$0.113	$2.35
	Eradication	507 7/8	5.4	-	-	-	3,245.27	-	-
	Fire	412 3/8	4.4	-	-	-	2,597.38	-	-
	Total - - -	9,352 7/8	100.0	-	-	-	$58,332.94	-	-

* On the basis of total man days, exclusive of checker foreman.

TABLE 8

ANALYSIS OF ALL REGULAR CHECKING IN THE SUGAR PINE REGION - 1939

Operation	Number of Check											
	First				Rechecks				All Regular Checks			
	Man Days	Acres	Total Cost	Cost Per Acre	Man Days	Acres	Total Cost	Cost Per Acre	Man Days	Acres	Total Cost	Cost Per Acre
Rogue River National Forest	148 5/8	8,609	$ 887.77	$.103	61 3/8	3,187	$ 366.61	$.115	210	11,796	$ 1,254.38	$.106
Siskiyou National Forest	360 4/8	18,526	2,153.36	.116	109 3/8	4,982	653.29	.131	469 7/8	23,508	2,806.65	.119
Lassen National Forest	103 6/8	7,538	693.46	.092	26	1,633	173.76	.106	129 6/8	9,171	867.22	.095
Plumas National Forest	355 2/8	16,383	2,198.78	.134	94 6/8	4,128	586.25	.142	450	20,511	2,785.03	.136
Eldorado National Forest	478 7/8	21,308	2,969.63	.139	220 2/8	9,095	1,365.59	.150	699 1/8	30,403	4,335.22	.143
Stanislaus National Forest	320 5/8	17,792	2,007.86	.113	99 5/8	5,056	623.67	.123	420 2/8	22,848	2,631.53	.115
Sierra National Forest												
(Bureau	456	23,044	2,935.47	.127	207 2/8	9,905	1,333.66	.135	663 2/8	32,949	4,269.13	.130
(Forest Service	147 6/8	9,613	965.42	.100	10 2/8	664	66.97	.101	158	10,277	1,032.39	.101
Lassen Volcanic National Park	25 6/8	2,022	162.26	.080	8 6/8	734	55.24	.075	34 4/8	2,756	217.50	.079
Yosemite National Park	290 3/8	14,290	1,801.40	.126	107 3/8	4,792	661.10	.138	397 6/8	19,082	2,462.50	.129
General Grant National Park	16 3/8	627	112.88	.180	-	-	-	-	16 3/8	627	112.88	.180
Sequoia National Park	120 4/8	4,595	792.10	.172	14 1/8	679	92.94	.137	134 5/8	5,274	885.04	.168
Regional Totals	2,824 3/8	144,347	$17,680.39	$.122	959 1/8	44,855	$5,979.08	$.133	3,783 4/8	189,202	$23,659.47	$.125

PART IV

SCOUTING FOR WHITE PINE BLISTER RUST

By

John C. Crowell, Agent

and

Harry G. Lachmund, Agent





INTRODUCTION

Scouting for white pine blister rust in northern California during 1937 and 1938 revealed a pronounced penetration of the disease into the Sugar Pine Region. Infections were located on Ribes near Buck's Lake and Cascade on the Plumas National Forest, thereby definitely placing the rust 160 miles south of the Oregon border. The purpose of the scouting program for 1939 was to make a more intensive survey of the white pine areas in northern California by studying developments in districts where infections had been found previously, and to determine the extent of the spread of the disease into new localities. Owing to the financial stringency, funds were available for the assignment of only two men to the scouting project in 1939. H. G. Lachmund was employed full time from July 17 to October 17 and J. C. Crowell, checking supervisor for the Lassen Forest-Lassen Park operation, gave about one half of his time during this period. In addition, a number of days were devoted to scouting by the Bureau's operation supervisors on the different forests, particularly by D. R. Miller and some of his assistants on the Sierra National Forest.

The precipitation during the winter of 1938 and 1939 in northern California was below normal and the snow pack in the mountainous regions had nearly disappeared early in May. The extended early drought and hot weather during and following the main period of aeciospore production in northern California evidently resulted in almost complete loss of viability of the aeciospores by the time the first period favorable to infection arrived. Infection on Ribes close to the sporulating cankers was noticeably reduced and a wide distribution of the disease was inhibited. Since these early drought conditions had prevailed during and following the main period in which aeciospores from the northern infection sources could have been dispersed over the still dryer sugar pine areas in the northern Coast Range and Sierra Nevada, it was evident that little infection on Ribes could have taken place or could be expected to be found in tracing the southward spread of the rust this year. This expectation was fully borne out by the failure to find rust on Ribes in subsequent scouting, although a wide area was covered and a large number of bushes were examined.

LOCATION OF THE WORK

The main scouting project began with an inspection of the old infection center on the East Fork of Indian Creek by Harris, Crowell, and Lachmund on July 21 - 23 and was extended by Lachmund into the nearby Grider Creek, the Hungry Creek, and the Beaver Creek territories on July 24 - 31. Blister rust was first found on Indian Creek in 1936 on sugar pines and Ribes and was followed closely by the discovery of Ribes infections generally spread over the adjacent areas. At the present time the rust is firmly established at several points on the Klamath National Forest over areas of sugar pine closely associated with Ribes.

Moving southward onto the Lassen National Forest, scouting work during August was confined to the areas around Viola, Morgan Springs, Mineral, and Chico Meadows. An intensified blister rust infection on Ribes had been found near Viola during 1938 but close searching this year failed to reveal any trace of the disease. In the Morgan Springs and Chico Meadows areas a large number of Ribes bushes were examined but no rust was found. The Summit Lake and Lost Creek areas on Lassen Volcanic National Park were likewise scouted without results.

On the Plumas National Forest, Crowell and Lachmund established temporary headquarters at Buck's Lake and spent one week scouting the surrounding territory. Good scouting conditions prevailed over much of this area and in nearby Granite Basin where the establishment of a control unit is contemplated. The fact that no infections were found since the party left the Klamath National Forest seemed to bear out the conclusion reached earlier that conditions during 1939 were highly unfavorable for the spread of blister rust. Further scouting in the Sierra Nevada appeared to be unnecessary and the scene of work was changed to the Mendocino National Forest on September 5.

The present year marks the first in which scouting included the Mendocino National Forest, where it was confined to the northeastern portion from the vicinity of Alder Springs northward to the forest boundary. Good scouting conditions were found in the Alder Springs area, but relatively

poor scouting prevailed over the remainder of the area scouted. Sugar pine was common and was mainly associated with Ribes lobbii and R. cruentum, with occasional R. nevadense. The roads and highways were, for the most part, along the ridge tops and were in good condition. Since no infections were found after ten days of searching, further work was abandoned in order to investigate the presence of certain rust infections that had been reported on the Sierra National Forest.

In the Shaver Lake district of Fresno County on the Sierra National Forest there exists an abundance of sugar pine in excellent association with R. roezli and R. nevadense. A large number of pinyon rust (Cronartium occidentale) infections had been reported from this vicinity and others were subsequently found, but blister rust was not included among the specimens identified by the Forest Pathology office in Washington, D. C.

On the Shasta National Forest scouting was done by Lachmund during late September and early October, covering the Hatchet Creek area, the Terry Mill district, Red Mountain to McCloud, and northeast from Big Bend. Fair to excellent scouting conditions were found along the roads where much of the scouting was done in order to cover the maximum amount of area in the limited time remaining.

METHODS OF WORK

Since organized scouting was largely done by a two-man party it was convenient for both men to work together much of the time. The selection of areas to be scouted was made as the season progressed and was influenced by circumstances surrounding the performance of the work and by information revealed by the scouting data. All work in the field was done in accordance with the blister rust scouting manual for the Sugar Pine Region for 1939. The general method of examining the Ribes in a selected area was to proceed in a manner that would readily permit the examination of a large number of Ribes leaves. Since the rust infects only the leaves on Ribes the essential criterion of scouting done is the amount of susceptible leaf foliage examined in any locality. It is necessary to know not only how many bushes of each species were examined, but how many were of the especially susceptible partial shade and shade forms and the size of the bushes as indicated by the average number of leaves per bush. Accordingly, columns were added to the scouting data sheet for light form and for the total number of leaves in thousands for each species. The latter figure was calculated by estimating the average number of leaves per bush and multiplying by the number of bushes examined. These data are essential for the interpretation of the significance of the records.

In order to keep records available for the follow-up by other investigative forces, a new system of treatment was developed for each infection found. The location of the infected bush or bushes was clearly marked with stakes to assist in relocating them. A sketch map was made to show the relative positions and the distance to the surrounding pines and Ribes.

WORK PERFORMED AND RESULTS OBTAINED

The intensity and extent of scouting in 1939 compared favorably with that of previous years in spite of the small force employed. A large basis of bushes of the most susceptible forms and species was examined, consisting primarily of Ribes roezli in the Sierra Nevada and of R. cruentum, R. bracteosum, and R. sanguineum in the Coast Range. Scouting was done by the Bureau's scouts in 217 sections, in 53 townships on six national forests, and one national park in California. The number of Ribes and pines examined for blister rust during 1939 is shown in Table 1. For convenience the data are classified by national forest and by Ribes species. The column for the total number of leaves has been added to indicate the relative amounts of susceptible foliage examined in each locality. The 813 white pines examined were small, ranging mainly from 3 to 15 feet in height. Trees in the vicinity of bushes where infection was known to exist in 1937 and 1938 were examined branch by branch.

The survey this year of the infection on the East Fork of Indian Creek revealed a great increase in aeciospore production over any previous year, largely due to the cankers of 1935 and 1936 origin which began to bear spores this spring. The great majority of the infections consisted of well developed cankers about equally divided in year of origin between 1935 and 1936. A small proportion may have resulted from infection in 1934. About 11 percent was in the incipient stage of development. Thus, hundreds of cankers produced spores this year as against a few during any previous year, thereby multiplying the number of aeciospores several hundred-fold.

In spite of this enormous increase in aeciospore production, infection of Ribes was virtually confined to leaves within a maximum of a few hundred feet from the cankers. Considering the volume of aeciospores produced and the susceptibility of the Ribes species involved, infection on the nearby bushes was relatively light and dwindled rapidly to scattered spot infections within short limits. Four or five miles downstream from the infection center only a single aecial infection of R. bracteosum was found on a total of about 535,000 leaves on 315 bushes of the part-shade form of this species and numerous plants of other susceptible species examined. Moreover, no infection could be found on a large basis of susceptible leafage of R. cruentum and R. bracteosum examined on Indian Creek from six to seven miles south of the infection center, nor on a still larger basis of part-shade R. sanguineum, R. lobbii, and R. cruentum along the ridge just east of the infection.

On Grider Creek, several miles south of Seiad Valley on the Klamath National Forest, a young sugar pine was found to have four incipient cankers, quite evidently of 1937 origin. This infection increases to three the number of places where pines have been found infected in California and extends the known range of pine infection in the state to a point approximately 14 miles south of the Oregon border.

The range of scouting, as shown in Table 1, for six national forests and one national park, involved the examination of approximately 35,420 bushes having an estimated total of 75,838,000 leaves.

The only infections of white pine blister rust found in California during 1939 were on the Klamath National Forest. There were, however, several infections of pinyon rust (Cronartium occidentale) found during the summer. This disease has been reported variously in different years over the Sierra Nevada and this year was generally prevalent in the Shaver Lake region on the Sierra National Forest. Farther north, on the Plumas, Lassen, and Shasta National Forests, where it was common in 1938, it was very scarce this year; altogether, only five infections were found on Ribes in all the scouting outside the Sierra National Forest. This scarcity probably resulted from the same unfavorable conditions which apparently inhibited the spreading of white pine blister rust.

SUMMARY AND CONCLUSIONS

1. In northern California, infection on sugar pines along the east Fork of Indian Creek has increased rapidly since its discovery in that vicinity in 1936; aeciospores are now produced in vast quantities.

2. Scouting results for the year 1939 indicate that moisture and prevailing wind conditions were unfavorable for the spreading of the rust during the period of aeciospore production. No infections were found outside the boundaries of the Klamath National Forest, even in localities where blister rust was found generously on Ribes during 1938.

TABLE 1

NUMBER OF RIBES AND PINES EXAMINED FOR BLISTER RUST IN CALIFORNIA DURING 1939

Host Species	Klamath National Forest			Lassen National Forest			Lassen Volcanic National Park			Mendocino National Forest			Plumas National Forest			Shasta National Forest			Sierra National Forest			Totals		
	Number of Bushes	Average Number of Leaves Per Bush	*Total Number of Leaves	Number of Bushes	Average Number of Leaves Per Bush	*Total Number of Leaves	Number of Bushes	Average Number of Leaves Per Bush	*Total Number of Leaves	Number of Bushes	Average Number of Leaves Per Bush	*Total Number of Leaves	Number of Bushes	Average Number of Leaves Per Bush	*Total Number of Leaves	Number of Bushes	Average Number of Leaves Per Bush	*Total Number of Leaves	Number of Bushes	Average Number of Leaves Per Bush	*Total Number of Leaves	Number of Bushes	Average Number of Leaves Per Bush	*Total Number of Leaves
Ribes bracteosum	489	1,573	769																			489	1,573	769
Ribes cereum																								
Ribes cruentum	696	2,740	1,907							1,407	2,372	3,338										2,103	2,495	5,245
Ribes inerme				1,022	1,100	1,127	10	500	5													1,032	1,096	1,132
Ribes klamathense	92	1,520	137																			92	1,520	137
Ribes lacustre	76	770	59																			76	770	59
Ribes lobbii	631	2,090	1,320							370	1,635	679										1,001	1,997	1,999
Ribes montigenum				379	1,500	569	150	1,000	150													529	1,360	719
Ribes nevadense				354	644	228				272	850	231	336	770	260	74	1,960	145	93	2,430	226	1,129	965	1,090
Ribes roezli				16,251	2,000	32,555	2,976	1,000	2,976				4,629	2,575	11,922	3,084	4,050	12,503	1,183	3,270	3,873	28,123	2,270	63,829
Ribes sanguineum	700	1,035	724																			700	1,035	724
Ribes viscosissimum				10	800	8				4	250	1	115	950	109	17	1,000	17				146	925	135
Totals or Averages	2,684	1,830	4,916	18,016	1,914	34,487	3,136	998	3,131	2,053	2,070	4,249	5,080	2,420	12,291	3,175	3,990	12,665	1,276	3,212	4,099	35,420	2,140	75,838

Pinus lambertiana	114	333	12	130	98	84	7	778
Pinus monticola	-	22	3	-	7	-	-	32
Pinus albicaulis	-	3	-	-	-	-	-	3
Totals	114	358	15	130	105	84	7	813

* Number of leaves expressed in thousands.

PART V - Section 1

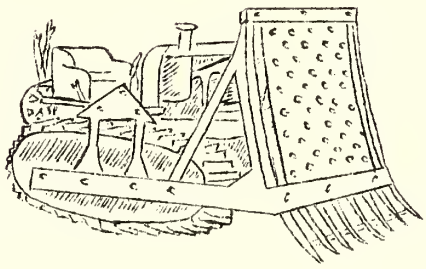
DEVELOPMENTAL WORK IN METHODS OF RIBES ERADICATION IN THE SUGAR PINE REGION FOR 1939

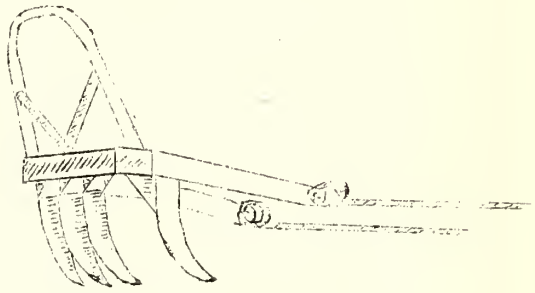
By

H. R. Offord, Pathologist,

and

L. P. Winslow, Agent





INTRODUCTION

This report gives the results of the field methods tests initiated in 1938, describes the developmental work undertaken during the field season of 1939, and provides a reference list of reports on laboratory and greenhouse activities for the period November 1938 to April 1939. There is also included a brief outline of the status of special Ribes eradication methods now recommended for practical field use.

During the 1939 field season, major attention was centered on the development of new hand eradication tools, on the use of dynamite, and on the design and testing of a D-2 Caterpillar bulldozer unit for work in upland type. For each of these special methods sufficient developmental work was completed to permit operations supervisors to use them in practical work.

One of the most encouraging features of the 1939 season was the interest shown by the operations supervisors in special methods of Ribes eradication. In the following list the scope of this practical work with special methods is briefly indicated. In Oregon: dry chemical, claw mattocks, and a tractor. On Lassen Volcanic National Park and the Lassen and Plumas National Forests: stream-type bulldozer, dry chemical, oil, claw mattocks, and dynamite. On the Sierra National Forest: dynamite, and the upland-type bulldozer. On Yosemite, General Grant and Sequoia National Parks: oil, dynamite, and a tractor.

The ecology work undertaken in the Sugar Pine Region during the 1939 season and details of the design and operation of the D-2 Caterpillar tractor unit are reported under separate titles.

RESULTS OF 1938 FIELD WORK

Broadcast Oil Tests in Oregon

During the period July 31 to August 4, the Ribes binominatum plots on Roundtop Mountain, Rogue River National Forest, Oregon, were checked. These plots were established August 26-31, 1938, to determine the practical lethal dosage of oil when applied as a broadcast spray. Although the amount of live stem was reduced, the broadcast oil treatment cannot be recommended for practical field work. The lethal dosage of the most effective mixture tried (Diesel oil 75% + SO_2 extract 25%) appears to be in excess of 2,400 gallons per acre. Since R. binominatum frequently grows in solid patches extending over several square rods, the dosage of oil required for the eradication of Ribes on an acre of such ground would be an appreciable percentage of the practical lethal dosage of 2,400 gallons.

The trailing aerial vines and underground stems of R. binominatum do not permit effective coverage without the application of prohibitive amounts of spray material.

Results of the application of oil to R. binominatum are shown in Table 1.

Decapitation Tests in Oregon

The R. bracteosum decapitation plots were checked on August 1. Since these plots had been established as a small-scale field trial of decapitation versus hand eradication, the bushes had not been staked. For this reason it was impractical to make a 100 percent check during the current year. Examination of the area indicated that the chemical was effective in dry and moist soil. In muddy and wet soil, however, many crowns had sprouted. Ammonium and sodium thiocyanate were about equally effective. The hand-worked area as a whole was much the cleaner of the two.

A saturated solution of ammonium or sodium thiocyanate may be used on decapitated R. bracteosum in comparatively dry sites, but in wet boggy sites its use is not recommended.

TABLE 1

RESULTS OF 1938 BROADCAST OIL TREATMENT OF R. BINOMINATUM, ROUNDTOP MOUNTAIN, ROGUE RIVER NATIONAL FOREST, OREGON

Plot No. [1]	Feet of Live Stem: Total Stem 1938	Current Season 1939	Old Stem 1939	Total Stem 1939	Percent Reduction of Live Stem	Number of Live Bush Crowns	Dosage in Gals. Per Sq. Rod [3]: #1	#2	#3	Number of Bushes Grubbed
1	400	41	0	41	90	21	15			
2	300	150	0.5	150.5	50	47	10			
3	600	125	0.5	125.5	80	46	7			
4	600	197	0.5	197.5	67	63	5			
5	600	142	13	155	74	100		15		
6	800	362	26	388	51	148		10		
7	200	225	49	274	0 [4]	100		7		
8	250	172	53	225	10	110		5		
9	600	165	15	180	70	127		15		
10	400	132	20	152	62	100		10		
11	150	88	13	101	33	54		7		
12	150	61	25	86	43	74		5		
13	350	124	52	176	50	121		15		
14	500	187	19	206	59	141		10		
15	200	33	6	39	80	32		7		
16	200	13	6	19	90	19		5		
17	400	111	8	119	70	111			15	
18	300	103	4	107	65	108			10	
19	250	46	18	64	74	77			7	
20	200	66	4	70	65	72			5	
21	250	33	9	42	83	48			15	
22	150	51	5	56	63	48			10	
23	300	74	10	84	72	112			7	
24	200	28	5	33	83	48			5	
25	300	70	1	71	76	62			15	
26	500	113	6	119	76	118			7	
27 [2]	400				0					
28 [2]	350				0					
29	150	3	0.75	3.75	97.5	6				54
30	600	5	0.25	5.25	99.12	6				261
31	600	12	3	15	97.5	15				175
32	400	4	1	5	98.75	13				207
33	350	3	3.75	6.75	98	21				229
34	700	4	2	6	99.4	6				317

[1] Plots 9-12, 17-20, and 25 and 26 had litter and decayed wood removed. Plots 1-8, 13-16, and 21-24 were sprayed without doing any preparatory work to the ground surface.

[2] Controls

[3] #1 = Diesel oil + SO_2 extract (3:1); #2 = Diesel oil + furnace oil (1:1) #3 = Diesel oil + furnace oil (3:2).

[4] 27 percent gain in live stem, original estimate evidently too low.

Decapitation Tests in California

On June 30 the small R. nevadense decapitation plot near Poison Meadow, Sierra National Forest, California, was checked. The dry sodium thiocyanate used on the crowns had proven salty enough to attract rodents, and cattle or deer. Most of the crowns had been gnawed by rodents, and in some cases cattle or deer had pawed out both crown and stake to get at the salty wood and soil. Twelve of the 40 crowns on the plot had been destroyed; 96 percent kill was obtained.

In the field trial of dry sodium thiocyanate applied to decapitated R. nevadense crowns along Dynamite Creek near Fish Camp, Sierra National Forest, a satisfactory kill was obtained where the crown had been covered. In some cases where the crown was only partially covered, because of interfering rock or brush, sprouting had occurred.

On June 30 a check was made of the R. cereum decapitation plot located near Beasore Meadow, Sierra National Forest, California. The application of the mixture of Diesel oil (1 part) and light crude oil (1 part) resulted in a 47 percent kill. On bushes having less than 1,000 feet of live stem, a kill of 83 percent was obtained, while on bushes having over 1,000 feet of live stem, a kill of only 22 percent resulted. Sprouting was not very prolific and further mortality may take place.

Treatment of Large Intact R. roezli by Means of Oil

The plots at Boggy Meadows, Sierra National Forest, California were checked on June 30. Here some 296 large intact R. roezli had been treated with approximately one pint of straight Diesel oil and 240 bushes with Diesel oil (1 part) plus SO_2 extract (1 part). Both oil mixtures were applied to the crown of the intact bush. The treatment with both mixtures proved to be fully effective. Numerous small bushes growing about the larger bushes and a few well established layered branches were not harmed.

Since it is virtually impossible to locate all crowns in large clumps of bushes, the use of the intact bush crown treatment method will necessitate reworking the following year either by hand, or with oil, to pick up the missed bushes. If mechanical equipment is not available, the oil treatment could be used to break down the live stem and bush count in the heavy concentrations prior to regular work.

Results of Dosage Tests of Diesel Oil on Small R. roezli Plants and the Effect of Oil on the Viability of Ribes Seeds

The six milacre oil plots established at Boggy Meadows, Sierra National Forest, California on October 18, 1937, were inspected June 30, 1939. As in 1938, the area had again been heavily grazed and the plots had been subjected to severe trampling by cattle. Results are listed in order of decreasing dosages:

Plot #6 - Dosage 5,000 gallons per acre. No vegetation of any sort on plot; badly trampled.

Plot #5 - Dosage 3,000 gallons per acre. No vegetation of any sort; badly trampled.

Plot #4 - Dosage 2,000 gallons per acre. Six current season R. roezli seedlings; some herbaceous plants have appeared; area badly trampled.

Plot #3 - Dosage 1,500 gallons per acre. Twenty-one current season R. roezli seedlings, one clump of grass, and several small R. roezli which had survived the initial treatment; badly trampled.

Plot #2 - Dosage 1,000 gallons per acre; 107 current season R. roezli seedlings; ground had been covered in spots with current season seedlings which apparently were drouth-killed; old R. roezli, grass, and other vegetation on the plot; moderate trampling.

Plot #1 - Dosage 500 gallons per acre; 62 current season seedlings; other conditions same as plot #2.

The current season seedlings were growing best under fairly large surviving R. roezli bushes which gave protection from the sun and cattle. The plots receiving dosages of 1,000 to 1,500 gallons of oil per acre showed a seedling germination similar to untreated surrounding soil.

On June 26 and 27, a check was made of the 29 milacre oil plots which had been established during August of 1938 on Chowchilla Mountain, Sierra National Forest, California. The fence erected at time of treatment had protected the area from grazing and trampling by cattle and deer. Briefly, these data indicate that the SO_2 extract, both straight and in mixture with Diesel oil, is somewhat more toxic to intact Ribes bushes than straight Diesel oil, or Diesel oil plus crude oil.

Sprays listed in order of toxicity:

	Percent of Bush Kill	Seedling Occurrence
Most toxic to least toxic	SO_2 extract	SO_2 extract
	SO_2 extract + Diesel oil	Diesel oil
	Diesel oil	SO_2 extract + Diesel oil
	Diesel oil + crude oil	Diesel oil + crude oil

No evidence can be secured from the data in Table 2 regarding the stimulation of Ribes seed germination by sublethal dosages of oil. It would appear that considerable mortality of Ribes seed results from the application of oil especially when it is used at the dosage rate needed to accomplish practical eradication of small intact R. roezli.

The plots were checked during the period of greatest current season seedling mortality. Dead seedlings were present on several plots, mainly on plots 9 and 19.

Table 2 shows results of the dosage tests for the various plots. Figure 1 shows graphically the relationship between dosage of oil and percent kill of bushes and Ribes regeneration.

Selective Treatment of R. roezli With Oil

On June 28 and 29, a check was made of the 22 Chowchilla Mountain plots established in July and August of 1938 for the purpose of testing the application of oil by selective methods to small intact R. roezli bushes. Table 3 shows plot data, and Figure 2 shows percent of kill for method of treatment and ratio of SO_2 extract and Diesel oil used.

Inspection of Figure 2 shows that the SO_2 extract-Diesel oil mixture in the ratio of 1:4 is the best herbicide for practical eradication of small R. roezli. The addition of SO_2 extract to Diesel fuel oil will increase the toxicity enough to partially compensate for poorly covered bushes, for variations in growth habit, and for differences in the capabilities of the persons applying the spray.

The necessity for adequate crown coverage is well illustrated by one bush examined in 1939. The bush had a crown stem 1/4 inch in diameter on which all the cambium, except a narrow strip about 1/8 inch wide, was killed. This slender life line had been sufficient to permit reestablishment of the bush. This year it had put out a healthy growth of foliage on current season stem.

Results of 1938 Methods Tests on the Eradication of Ribes roezli Seedlings by Oil

The large-scale methods tests on eradication of young, intact R. roezli bushes by means of an oil spray were checked during the period July 5 to 18. A 10 percent check was run on all oil work and all of the pick work in section 34, and a 5 percent check was run on a portion of the pick work in section 27. A summary of the results is given in Table 4. Figure 3 shows curves for the comparative effectiveness of oil and pick work, and Figure 4 shows per acre averages taken from checking data.

Due to the unusually dry season, those portions of the area lying on moist northern slopes were heavily grazed by cattle and in some instances a considerable portion of the Ribes live stem had been bitten off. Current season seedling mortality had been generally high, and in dry sites old live stem was dying back on many of the small bushes.

Results indicate that with concentrations above 3,000 per acre (post check figures) it is more efficient to spray small Ribes than to dig them. By projecting the time point P (p. 98, 1938 annual report) onto Figure 3 along the "3,000 bushes per acre" line, oil appears to be 12-1/2 percent more efficient than grubbing at this bush density. This conclusion is substantiated by previous observation of field work. On an area supporting 3,000 small bushes per acre (post check figures) or actual counts of 8,000 to 10,000, these bushes will occur in patches. A single square rod may bear bushes at the rate of 100,000 per acre. During eradication by digging methods in these exceptionally heavy patches, some bushes are trampled and covered up by the crews. With eradication by oil spray, there is less

TABLE 2

RESULTS OF 1938 DOSAGE TESTS OF NEW OIL MIXTURES ON SMALL RIBES ROEZLI BUSHES, CHOWCHILLA MOUNTAIN, SIERRA NATIONAL FOREST, CALIFORNIA

Plot No.	Bushes on Plot 1938	Bushes on Plot 1939	Percent of Kill	Dosages in Gallons per Milacre: SO_2 Extract	Diesel Oil 1/	SO_2 + Diesel Oil	Diesel Oil + Crude	Seedlings 1939
28	195	20	90	0.5				15
1	43	3	93	1.0				-
2	105	4	96	1.5				2
3	55	-	100	2.0				-
4	70	-	100	3.0				-
5	137	1	99	5.0				-
6	94	-	100	10.0				-
7	18	3	83		1.0			1
8	85	3 5/	96		1.5			8 5/
9	76	5	93		2.0			43/
10	56	-	100		3.0			-
11	59	-	100		5.0			-
12	35	-	100		10.0			-
13	58	17	71				1.0	54
14	94	8	91				1.5	17
15	21	42/	81				2.0	9
16	109	-	100				3.0	1 4/
17	110	5	95				5.0	1
18	65	-	100				10.0	-
29	57	-	100			0.5		24
19	77	6	92			1.0		93
20	210	13	94			1.5		22
21	23	1	96			2.0		7
22	46	-	100			3.0		3
23	127	-	100			5.0		-
24	135	-	100			10.0		-
25	209	212	None					87
26	25	25	None					137
27	170	202	None					81

1/ Diesel Oil

2/ By rock

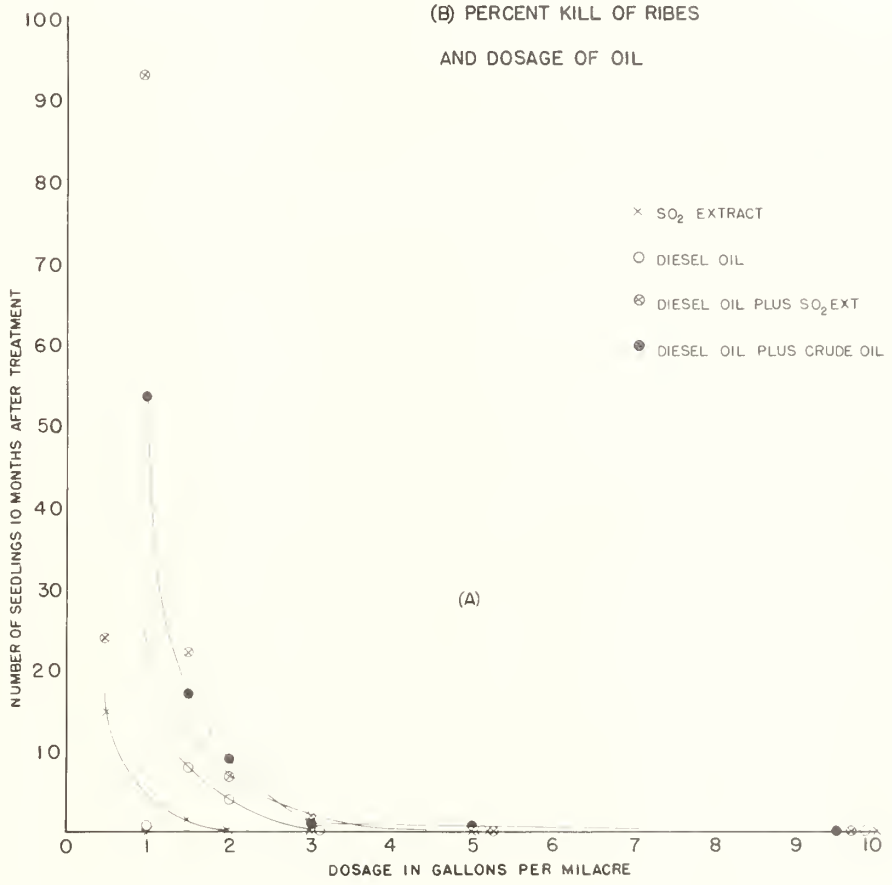
3/ Under chip

4/ Under dried bovine deposit.

5/ Under lupin at edge of plot

FIGURE 1

RELATIONSHIP BETWEEN
(A) RIBES REGENERATION
(B) PERCENT KILL OF RIBES
AND DOSAGE OF OIL



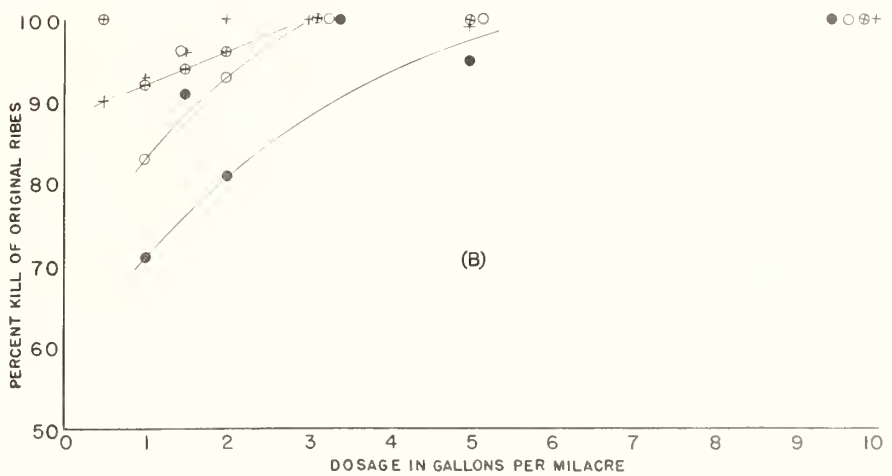


TABLE 3

RESULTS OF 1938 SELECTIVE TESTS OF NEW OIL MIXTURES ON RIBES ROEZLI, CHOWCHILLA MOUNTAIN, SIERRA NATIONAL FOREST, CALIFORNIA

Plot Number	Bushes Treated 1938	Bushes Alive 1939	Percent Kill of Treated Bushes	Bushes Untreated 1939 5/	Dosage Gallons Per Plot	Percent SO_2 Extract in Diesel Oil	Type of Selective Treatment	Seedlings 1939
1 1/	1,065	1	99.9	37	30.0	50	H 2/	358
2	930	28	97.2	49	9.0	44	L 2/	1,649
3	400	66	83.5	22	5.0	100	L	178
4	1,500	85	94.4	36	15.0	0 3/	L	274
23	240	7	97.3	29	4.0	5	H	237
5	508	15	97.2	19	9.0	10	H	651
6	425	17	96.1	22	5.0	10	M 2/	573
7	550	14	97.4	23	7.5	10	L	214
8	490	5	99.0	12	8.5	20	H	1,216
9	650	21	96.8	32	8.0	20	M	1,065
10	580	13	97.8	34	7.5	20	L	365
11	900	13	98.4	22	15.0	30	H	373
12	640	18	97.2	26	9.0	30	M	391
13	812	27	96.7	21	14.0	30	L	268
14	720	3	99.5	29	12.0	40	H	171
15	380	6	98.5	13	5.0	40	M	171
16	571	33	94.3	14	7.3	40	L	467
17	500	4	99.3	38	10.0	50	H	132
18	710	35	95.2	21	9.5	50	M	195
19	331	25	92.5	30	5.5	50	L	84
20	300	13	95.8	25	6.5	0 4/	H	1,162
21	560	87	84.5	42	8.0	0	M	709
22	552	94	83.0	18	8.5	0	L	All Dead
24	257	25	90.4	29	4.0	66	L	219
25	300	9	97.0	18	3.0	80	L	128
26	312	15	95.2	15	4.0	100	L	95

1/ Ground area of preliminary test plots 1-4 not measured. All other plots 1/4 square chain in area.

2/ H = heavy application, complete bush coverage and additional oil on crown
M = Medium application, complete bush coverage
L = Light application, crown coverage only

3/ Mixture of Diesel oil and light crude oil (1:1)

4/ Straight Diesel oil

5/ Untreated bushes were of 1937 or 1938 origin which were so small at time of initial work that they escaped treatment.

FIGURE 2

COMPARISON OF PERCENT KILL OF R.ROEZLI PROVIDED BY SEVERAL NEW OIL MIXTURES APPLIED IN LIGHT, MEDIUM, OR HEAVY DOSAGE

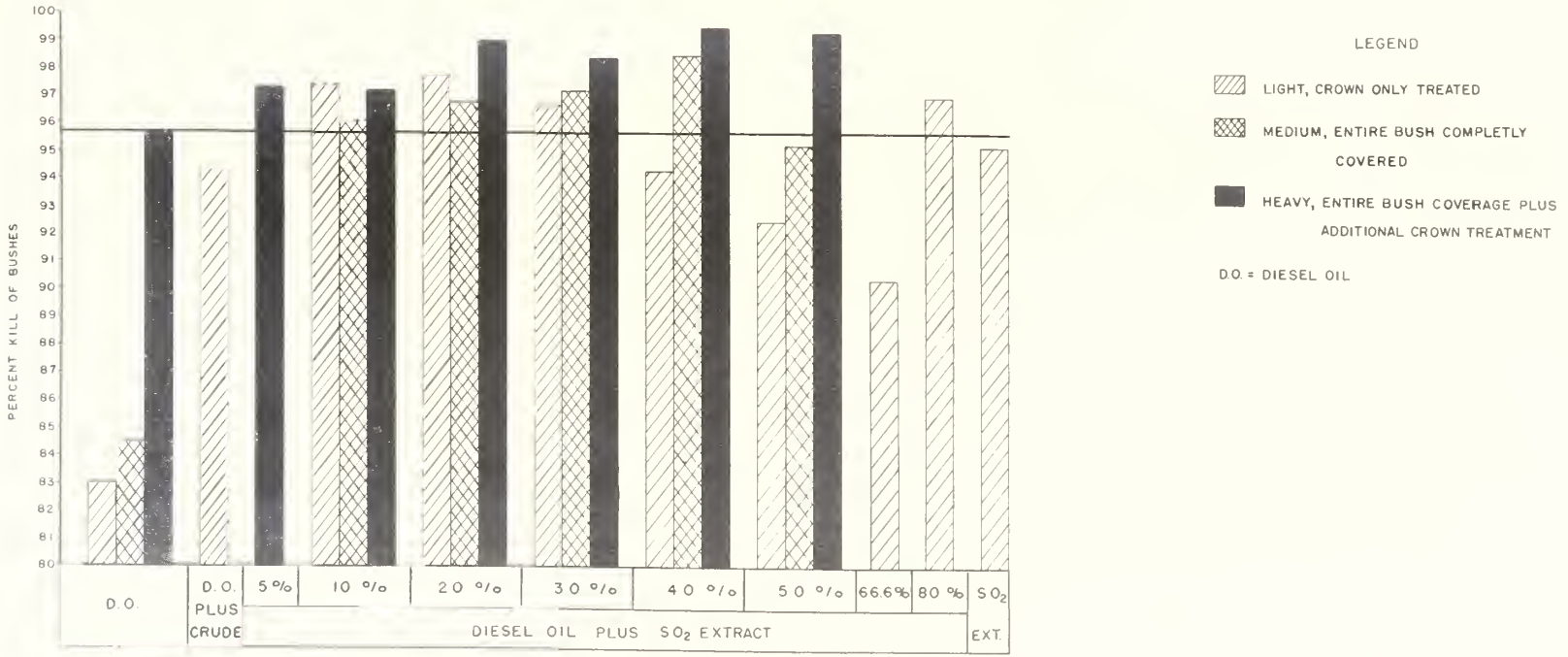


TABLE 4

RESULTS OF 1938 METHODS TESTS ON YOUNG, INTACT, R. ROEZLI BUSHES, OIL SPRAY, AND HAND ERADICATION WORK UNDERTAKEN ON CHOWCHILLA MOUNTAIN, SIERRA NATIONAL FOREST, CALIFORNIA

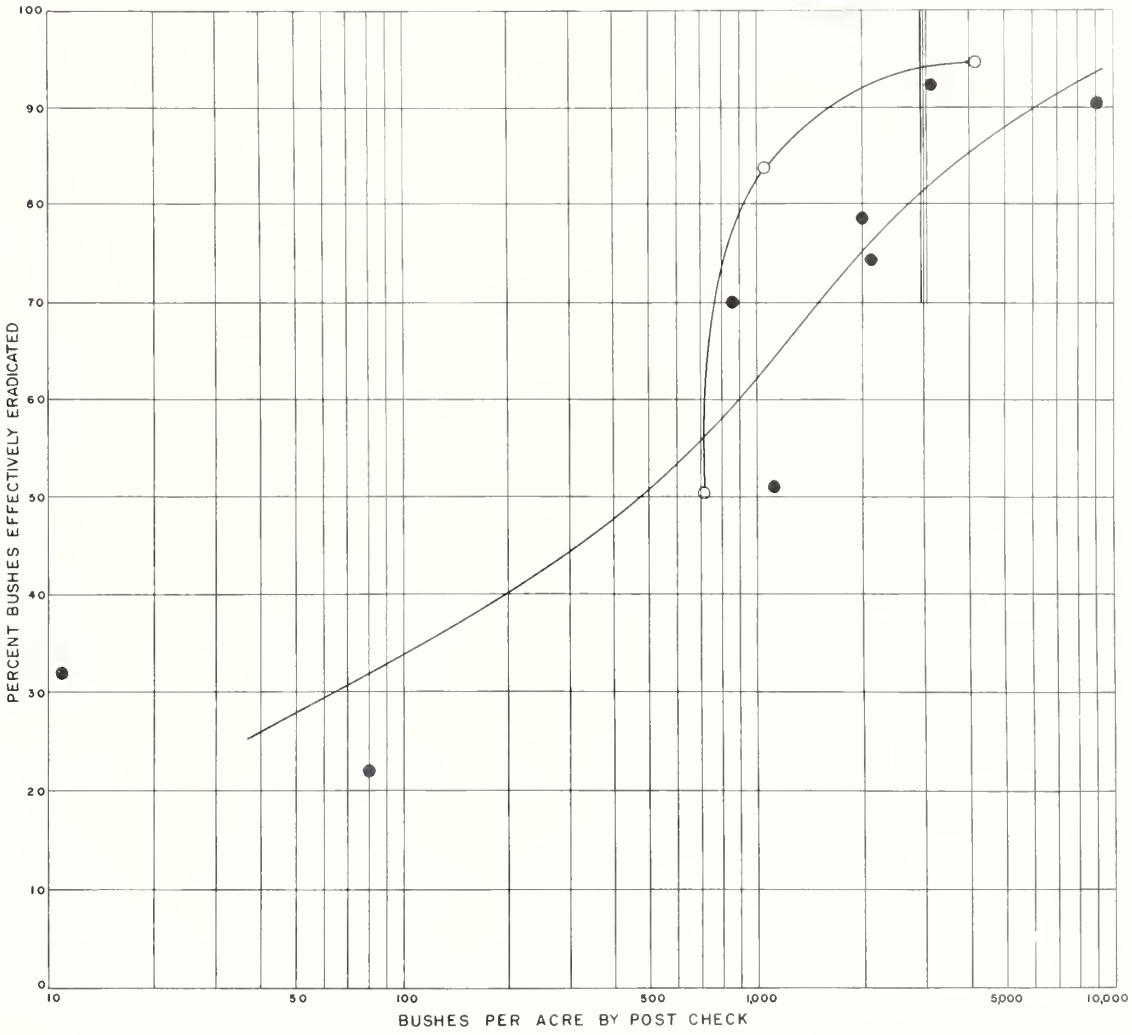
Section	Block Number	Acres in Block	Bushes Per Acre: Post Check 1937	Bushes Per Acre: Post Check 1938	Post Check 1 Year After Work 1939	Percent of Bushes Destroyed	Gallons Oil Per Acre[1]	Bushes Grubbed Per Acre	Acres Per Man Day	Feet of Live Stem Per Acre 1939	Gallons Oil Per Bush
34	1	37.5		856	257	70.0		3,334	0.403	411	
	2	57.5		2,060	441	78.6		5,655	0.272	533	
	3	37.5		80	62	22.5		408	2.340	88	
	4	7.5		9,032	851	90.6		14,340	0.134	965	
	5-A	12.5		4,354	213	95.1	43.60		0.193	302	0.0100
	5-B	10.0		3,396	240	92.9		9,934	0.147	337	
	6	5.0	0		8			66	1.500	14	
	7	20.0	1,078		177	83.6	37.75		0.189	235	0.0350
	8	1.5	0		0	100.0		563	0.500	0	
	9	3.0	12		8	33.3		0	1.200	33	
	10	28.3	618		308	50.2	27.60		0.238	399	0.446
	11	4.5	2,124		561	73.5		4,040	0.221	755	
	12	2.7	0		0	100.0		34	0.902	0	
	13	16.0	1,153		563	51.2		4,252	0.444	712	
27	2	80.0		631	73	88.6		1,517	0.588	138	
	6	100.0		195	42	78.5		993	0.603	77	
	7	15.0		35	8	77.1		391	0.600	9	
	8	45.0		1,756	75	95.7		2,561	0.274	114	

1/ Gallons of oil per acre as here given signify quantity used in treating the Ribes on an acre of ground and should not be compared with the much higher dosage figures per acre shown in other parts of this report.

FIGURE 3

COMPARATIVE EFFECTIVENESS OF OIL AND GRUBBING FOR THE ERADICATION OF SMALL R. ROEZLI. RESULTS OF 1938 METHODS TRIALS, SIERRA NATIONAL FOREST, CALIFORNIA.

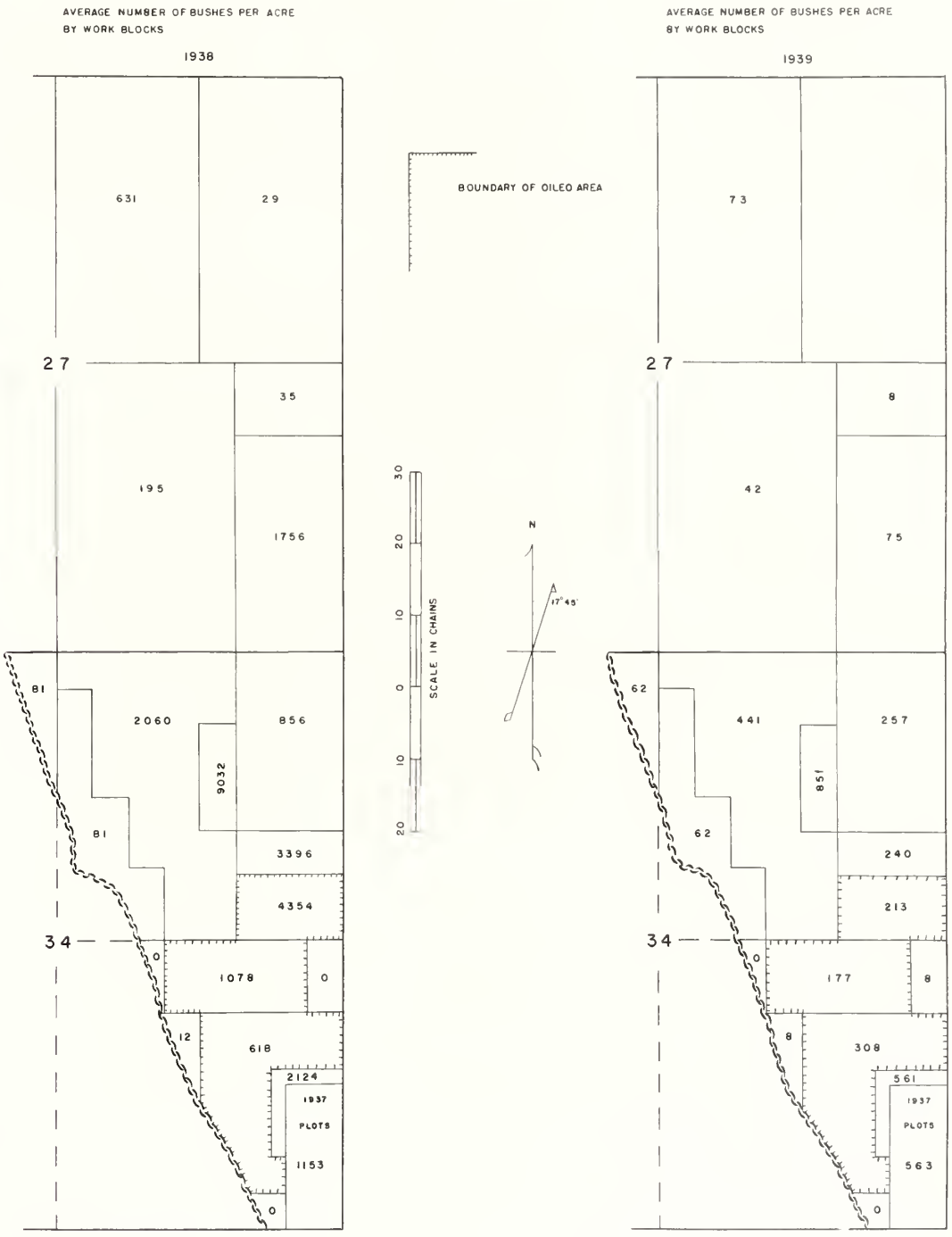
BUSH COUNT, BY POST CHECK FIGURES, AT WHICH OIL SPRAYING BEGINS TO SHOW SAVING OF TIME, (SEE PAGE 98 OF THE 1938 ANNUAL REPORT).



— FIGURE 4 —

RESULTS OF
1938 METHODS FIELD TRIALS
SIERRA NATIONAL FOREST, CALIFORNIA

R. ROEZLI SEEDLINGS CAMP NO. 2 AREA
T 4 S. R. 20 E.



trampling, and little or no soil disturbance.

The 1938 work was based upon regular field records such as the checking and eradication organizations take for their own information. Such data are not applicable to small areas; consequently, it was not feasible to make a thorough statistical analysis by breakdown into small plots. A five percent check is not valid for areas of less than 20 acres and is best applied to areas of 40 or more acres.

The amount of live stem present per acre in 1939 shows the need for further study of such troublesome areas to determine the most economical means of attaining maintenance standards in a reasonable length of time.

METHODS WORK UNDERTAKEN DURING THE 1939 FIELD SEASON

Use of Dynamite in Ribes Eradication

The preliminary trials of dynamite for the eradication of large Ribes nevadense which were made on the Sierra National Forest, California, in 1938, by F. A. Patty, Arthur London, and L. P. Winslow were sufficiently encouraging to justify further tests during the field season of 1939.

From May 18 to September 11, fourteen trials of blasting were made in California using 20 or 25 percent dynamite under varying conditions of soil moisture, soil character, brush cover, and slope. The following Ribes species were included in these tests:

Location	Number of Tests	Ribes Species
Sierra National Forest	8	R. roezli, R. nevadense, and R. cereum
Plumas National Forest	2	R. inerme in willow and alder; R. roezli and R. nevadense
Plumas National Forest	1	Ditching to drain R. inerme swamp
General Grant National Park	2	R. cereum
Sequoia National Park	1	R. roezli in rock ballast

Over 300 shots were fired using approximately 350 pounds of powder. The above tests include a number of demonstrations staged for personnel of the Forest Service, Park Service, and the Bureau.

A small 10-cap blasting machine of the magneto type was used to set off the electric caps employed for detonation of the dynamite charges. Two grades of powder were used: Hercules 25 percent in quarter pound sticks 7/8" by 8", and Trojan 20 percent in half pound sticks 1-1/4" by 8".

Table 5 lists the approximate amount of 20 percent powder needed for a given Ribes species under normal conditions. Where Ribes are growing in dense brush a greater amount of powder is needed for effective removal of the clumps.

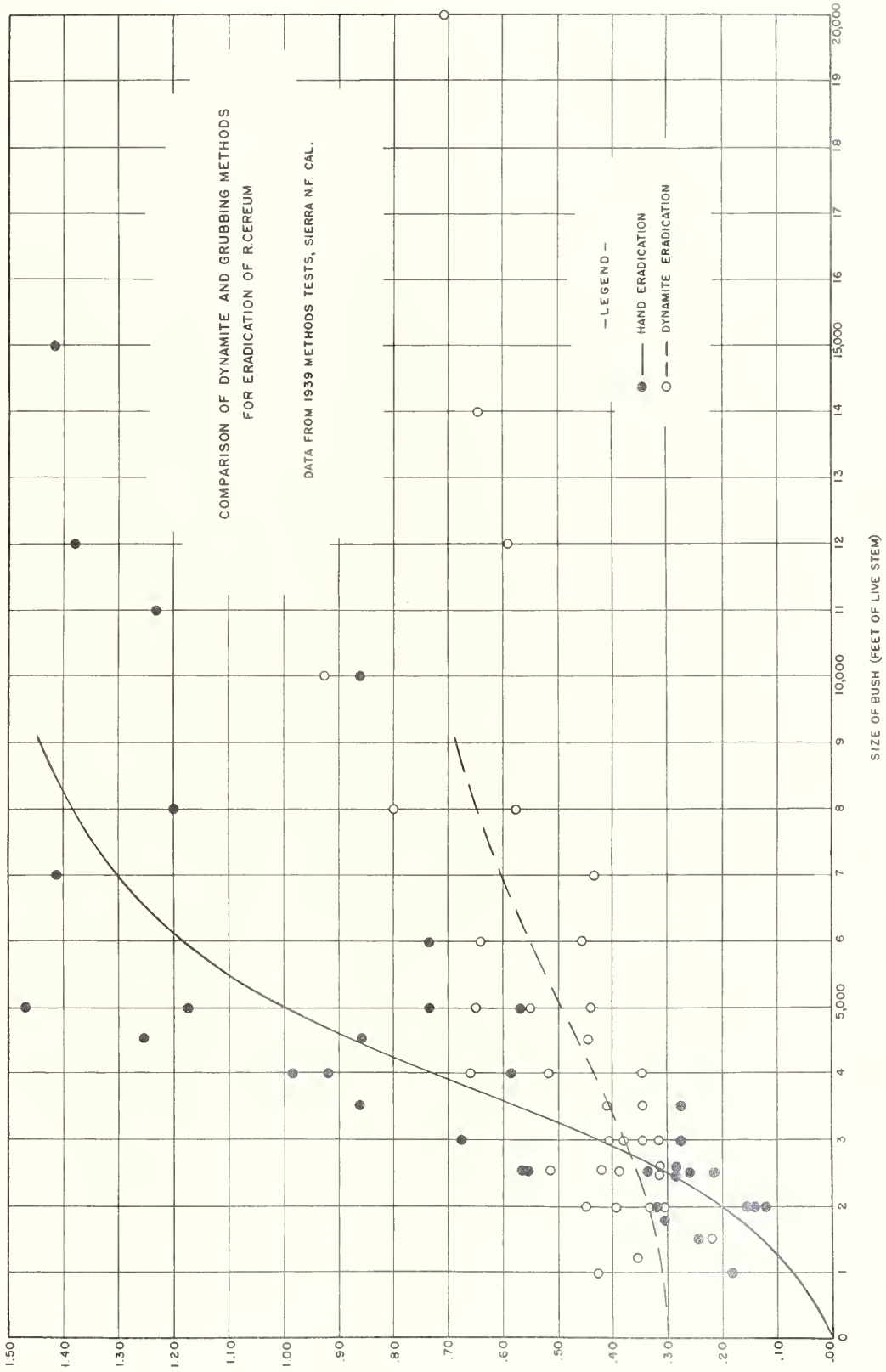
As a method for using the data presented in Figure 5, it is suggested the field man go over an area bearing Ribes cereum and estimate on an acreage basis the number of bushes having 2,800 feet of live stem or more. Bushes of this size can be eradicated more cheaply with dynamite than by hand whenever they are numerous enough to justify departure from the standard practice of digging. Another practical way to apply the data given in Figure 5 would be: Assume a man-day cost of six dollars for a 6-1/2 hour man-day. On this basis, a bush requiring over thirty minutes' digging time for one man, or over fifteen minutes' digging time for two men could be removed more cheaply with dynamite.

TABLE 5

POUNDS OF 20 PERCENT POWDER NEEDED TO ERADICATE LARGE RIBES, FOR SOIL CONDITION AS SHOWN

Ribes Species	Wet	Moist	Dry
R. nevadense	1/4 - 1/2	1/4 - 1	1/2 - 2
R. cereum	-	1/2 - 1	1 - 3
R. inerme in willow	1	1 - 2	2 - 4
R. inerme in alder	1 - 3	2 - 5	3 - 6+
R. roezli	-	1/2 - 1	1 - 3+

FIGURE 5


COMPARISON OF DYNAMITE AND GRUBBING METHODS
FOR ERADICATION OF R.CEREUM
DATA FROM 1939 METHODS TESTS, SIERRA N.F. CAL.
—LEGEND—
HAND ERADICATION
DYNAMITE ERADICATION
COST IN DOLLARS PER BUSH
SIZE OF BUSH (FEET OF LIVE STEM)
1.50
1.40
1.30
1.20
1.10
1.00
.90
.80
.70
.60
.50
.40
.30
.20
.10
.00
0
1
2
3
4
5,000
6
7
8
9
10,000
11
12
13
14
15,000
16
17
18
19
20,000

R. cereum Paired Bush Tests

To obtain data on labor and materials for comparison of hand eradication and blasting, 34 pairs of R. cereum bushes ranging from 1,000 to 20,000 feet of live stem were used in a series of field tests. One bush of each pair was dug by hand and the other blown out with dynamite. The crown material remaining after blasting was cleaned out by hand. A record was made of time consumed per bush and all materials used. Table 6 gives a summary of field data obtained in the study and Figure 5 shows the relationship between the cost per bush and feet of live stem per bush for both methods. The intersection of the two curves at 2,800 feet of live stem and thirty-six cents per bush indicates dynamite to be cheaper than hand eradication for bushes above medium size. Plot data as a whole indicate a labor ratio of roughly 2:5 in favor of dynamite with an average saving of thirty and two-thirds cents per bush for the plot. The four pictures shown in Plate I illustrate the difficulties of eradicating large R. cereum by hand methods. One picture shows a typical large R. cereum being blasted.

Two 2-man crews and one 1-man crew were used in the grubbing work. A methods man did the blasting with the assistance of a relief worker to clean up the holes, carry powder and string firing wire. The men who did the digging were far above the camp average. Some time was lost in both methods of eradication due to the scattered location of the selected bushes. The cleanup man on the dynamite crew was totally lacking in experience as a powder monkey.

Tools used for hand work were -- large pick mattock, Pulaski, shovel, long-handled pruning shears, and double-bitted ax.

Tools used for powder work were -- 1 half-inch diameter pointed steel bar, long-handled pruning shears, 400 feet of insulated wire, wooden tamping bar, and magneto detonator.

Dynamite is not recommended as a method of eradication where mechanical means may be employed (i.e., tractor or horse-drawn hooks, or bulldozer); but where hand methods must be used on large bushes, time and expense may be saved by the use of dynamite.

Use of Dynamite in the National Parks

At the suggestion of F. A. Patty, a demonstration of the use of dynamite for the eradication of large R. cereum was staged in the General Grant National Park where the bushes were all being dug by hand with CCC labor. After watching the powder work, the Park Service men in charge of blister rust work on the General Grant, started the use of dynamite on the large bushes which took a prohibitive amount of time to remove by hand. On the Sequoia National Park dynamite was used on R. roezli which had been covered up by rock ballast, and where Ribes were buried by erosion.

TABLE 6

SUMMARY OF RIBES CEREUM TIME STUDY ON PAIRED BUSHES - DYNAMITE VERSUS HAND ERADICATION, SIERRA NATIONAL FOREST, CALIFORNIA - 1939

Item	Dynamite	Hand Eradication
Number of bushes eradicated 1/	36	34
Number of men in crew	2	5
Total working time (in minutes) for crew	370	350
Total time expended in man minutes	740	1,750
Man minutes loading powder	230	-
Man minutes mop-up after blasting	146	-
Man minutes priming powder cartridges	48	-
Man minutes fixed time (firing, stringing wire, carrying powder, etc.)	316	-
Average man minutes per bush	20.555	51.470
Average mop-up time (man minutes) per bush	4.055	-
Average fixed time (man minutes) per bush	10.111	-
Percent of man minutes expended for loading	31.1%	-
Percent of man minutes expended for mop-up	19.7%	-
Percent of man minutes expended for priming	6.5%	-
Percent of man minutes expended (fixed time)	42.7%	-
Total pounds of dynamite used	48.5	-
Average pounds of dynamite per bush	1.347	-
Total number of caps used (one per hole)	61	-
Average number of caps per bush	1.694	-
Average cost of labor per bush at $6.00 per man day ($0.015384 per man minute)	$00.3162	$00.7918
Average cost of blasting materials per bush with dynamite at $7.50 per 100 lbs. and caps at $4.00 per 100 lbs.	$00.1687	-
Average total cost per bush 2/	$00.4849	$00.7918
Average saving per bush	$00.3069	-
Average percent saving per bush	38.63%	-

1/ The bushes had been paired and tagged before work started. Some time was spent walking from bush to bush and looking for tags. The area was not worked clean, only the selected bushes being eradicated.

2/ Bushes ranged from 1,000 to 20,000 feet of live stem per bush, 44 of the 70 bushes having over 2,500 feet of live stem.



Typical open-grown R. cereum in the Sierros. Nate sugar pine reproduction in background. Sierro Notional Forest.



Hand erodicotion crew digging large R. cereum. Note size of bush crown. Brush top piled at right.



Eradicotion of large R. cereum with dynamite. On this bush 1½ lbs. of 20% powder were used.



R. cereum shown in blosting shot at left. Five minutes of mop-up work wos needed to remove the loosened bush.

Horse-drawn Ribes Hook

The testing of a horse-drawn hook for the removal of large R. roezli was started in 1938 and continued during 1939. On May 23 and 24, the tools constructed at the end of the 1938 field season were tried out behind a 1,400 pound team. As a result of this trial the following conclusions were reached: (1) for the hook, welded rather than bolted construction should be used; (2) a team of at least 1,600 pounds each should be used; (3) the method can be employed in loose soil to good advantage; (4) bushes up to 200 feet of live stem in size, except those rooted in very rocky soil, can be removed by horse power.

On the basis of the tests made in May of the current year, J. F. Breakey of the Spokane office, designed and built a 4-toothed, all welded hook for use with a team of horses. This tool (see Plate 3 of the section of this report devoted to Mechanical Power Methods) was subsequently tried on R. cereum in Oregon, and on R. roezli in California. Since horses were difficult to obtain for short periods, a 1-1/2 ton truck was employed for pulling power, and later the tool was used on the drag line behind a 25-horse-power tractor. Good results were obtained on all trials, the weight (85 pounds) being the only objectionable feature of the hook. For R. cereum, the Oregon model hook is the better of the two.

The 5- and 6-toothed hooks, designed for use on the drag line behind the tractor would not be practical for use with horses because the long teeth and the wide 20-inch frame would be more than a team of two horses could pull.

For areas too small to warrant moving in a tractor outfit, but with an abundance of moderate-sized, open-grown bushes, the horse-drawn hook could be employed at a definite saving over hand eradication.

1939 Toxicity Tests of New Oil Sprays

At the request of the Bureau, additonal field tests were made to determine the toxicity of Diesel oil, furfural, furfural saturated with ammonium thiocyanate, and these materials in various combinations with one another. Since the plots were treated, a Public Service Patent (No. 2,173,236) has been granted on the combination of Diesel oil, furfural, and ammonium thiocyanate. However, as a matter of record, the work is reported and the results will be summarized when available.

On August 14-16 the plots were laid out and data taken: they were sprayed on August 17-21. The area selected for the test plots was near the old slaughter house in Ockenden's Meadow one-half mile south of Shaver Lake, sec. 36, T. 9S., R. 24E. Spraying was done with the compressed air sprayers of design similar to those used in Idaho on R. petiolare rework. Plot data are shown in Table 7.

TABLE 7

TOXICITY TESTS OF DIESEL OIL, FURFURAL, AND FURFURAL SATURATED WITH AMMONIUM THIOCYANATE, SIERRA NATIONAL FOREST, CALIFORNIA
TESTS MADE IN AUGUST, 1939

Plot No.	Number of Bushes Treated	Total Feet of Live Stem	Total Feet of Dead Stem	Area of Plot (Sq. Rods)	Dosage in Gallons Per Square Rod			
					Diesel Oil	Furfural	Furfural[1/] with Thiocyanate	Water
1	60	1,218.5	56	1/2		1-1/2		13-1/2
2	68	1,259.0	83	1	13-1/2		1-1/2	
3	57	400.5	38	1/2			1-1/2	13-1/2
4	60	831.5	109	1	13-1/2	1-1/2		
5	68	997.0	60	1	15			
6	83	1,254.5	263	1	15			
7	90	1,892.5	334	1	13-1/2		1-1/2	
8	71	3,360.0	521	1	13-1/2	1-1/2		
9	70	2,046.0	101	1			1-1/2	13-1/2
10	70	992.5	56	1/2		1-1/2		13-1/2

1/ Furfural saturated with ammonium thiocyanate.

1939 Decapitation Tests with Application of Salt-borax Mixture to Crowns

On October 4, 1939, 112 rockbound Ribes bushes of various species were cut off above or through the crown and the crowns treated with a 1:1 mixture of common salt (NaCl) and borax (sodium tetraborate - $Na_2B_4O_7.10H_2O$). The test area is located on Tunnel Creek at the mouth of the Huntington-Shaver Lake tunnel near Shaver Lake. Plot data are shown in Table 8.

Use of the Decapitation Method and Dry Chemical or Oil in the National Parks of California

The rugged and rocky terrain of some of the National Park Service control units necessitated the use of dry chemical or oil on the decapitated crowns of troublesome Ribes. In some areas intensively used by the public, decapitation and oil treatment of the crowns was employed to minimize ground disturbance, thus contributing to preservation of the natural scenic values. The following summary presents the highlights of the chemical work done on national parks in California:

Lassen Volcanic National Park. - On the northeast slope of a steep boulder strewn moraine near Lost Lake, 10 to 15 percent of the Ribes were found to be rockbound. Dry sodium thiocyanate was used on the decapitated crowns of some 585 Ribes bushes, and Diesel oil (2 parts) plus crankcase oil (1 part) was used on the decapitated crowns of over 2,000 Ribes bushes. The following Ribes species were involved in this work: R. cereum, R. nevadense, R. roezli, and R. viscosissimum. Dry chemical was transported in waterproof paper bags and oil in 5-gallon knapsack gravity sprayers.

Sequoia National Park. - On the granite cliffs and creek bottoms, chiefly in the Marblefork area, rockbound Ribes bushes were decapitated and the crowns treated with Diesel oil. Regular quart canteens equipped with screw caps or cork were found to be the most satisfactory containers for transportation of the oil. Many of the bushes had to be reached by means of rope slings of the "Bosun Chair" type.

Yosemite National Park. - Along some of the main traveled roads, eradication of Ribes was begun, using the decapitation and oil treatment of the crown to minimize ground disturbance and to preserve the natural beauty of the associated vegetation. The bush tops were carried or hauled away and oil applied by means of pressure sprayers of the packboard type. The work was discontinued because of fall rains but will be continued in 1940.

TABLE 8

DECAPITATION TESTS ON ROCKBOUND R. ROEZLI, R. CEREUM, R. NEVADENSE, AND R. VISCOSISSIMUM
TUNNEL CREEK, SIERRA NATIONAL FOREST, CALIFORNIA, OCTOBER 4, 1939

Species	Total Number Bushes Treated	Dosage Classes in Ounces (Avoir.) - Number of Bushes Treated												Total Chemical 1/ Used (Oz.)
		3.45	4.60	6.90	9.21	10.36	13.81	17.26	18.41	20.71	23.01	27.62	41.42	55.23	
Ribes roezli	57	13	3	19	2	5	7	1		3	1	3			541.965
Ribes cereum	11	1		6			2					1		1	155.340
Ribes nevadense	9	1		1		1	2		1	1			1	1	184.106
Ribes viscosissimum	35	2	2	13	2	4	10	1		1					341.748
Totals	112	17	5	39	4	10	21	2	1	5	1	4	1	2	1,223.159

1/ Salt + borax (1:1)

Experimental Eradication of R. tularense in Sequoia National Park, California

On parts of the Sequoia National Park, California, R. tularense, a trailing, multiple-rooted bush, grows extensively and thickly enough to be given consideration as a special eradication problem. The growth habits and morphological characteristics of this bush closely resemble that of R. binominatum of southern Oregon and northern California. The control unit of Sequoia National Park includes a considerable acreage of so-called tularense type within its boundaries.

Since no previous eradication work of this species had been done, F. A. Patty carried out a small-scale experimental project in the vicinity of Marble Fork CCC Camp to obtain information upon, (1) cost per acre; (2) type of tools; (3) approximate number of bushes per acre; (4) digging technique; and (5) potentialities of regeneration.

Six acres in timber were worked, 92.5 CCC man-days being required to cover the ground and dig 28,683 Ribes. The most effective tool was found to be one having a pick point and a flat claw blade. The following data indicate the work that will have to be done to eradicate this species: 15.4 man-days per acre, 4,780.5 Ribes per acre, 310 Ribes per man-day.

Because the Park Service is opposed to broadcast chemical sprays and mechanical power methods in intensive use areas, future developmental work in the eradication of R. tularense will have to be confined to hand tools.

Experimental Eradication of R. montigenum in Yosemite National Park, California

The eradication of Ribes in the white pine type of the Sierras, presents a special problem because of the growth habits of R. montigenum. This Ribes grows in dense patches or mats in close association with the white pines. The only eradication of R. montigenum performed so far in the Sugar Pine Region was at Lassen Volcanic National Park in 1938.

To obtain information applicable to local conditions, F. A. Patty carried out a small-scale experimental project at the Tenaya Lake CCC spike camp, Yosemite National Park.

Upon seven acres, 62 man-days were spent removing 11,041 R. montigenum and 1,050 R. viscosissimum bushes, or a total of 12,091 Ribes. On an acreage basis, these figures are equivalent to 195 Ribes per man-day, 8.86 man-days per acre, and 1,727 Ribes per acre.

The following information was obtained from the tests: (1) the claw-type tool is very effective; (2) R. montigenum does not present as troublesome a problem as the heavier concentrations of R. roezli on logged-off lands; (3) the cost of working areas supporting medium to light concentrations should not be excessive; (4) oil may be needed on bushes growing in rock; (5) dynamite may be needed for buried bush clumps on talus slopes; and (6) an effective plan of eradication appears to be one consisting of a rapid first working followed by a thorough reworking a few years later.

Development of New Eradication Tools

During 1939, considerable interest was shown by field supervisors in the development of new eradication tools to facilitate regular grubbing work. In the western white pine region, about 3,500 claw mattocks are now in use. These tools were made from the medium weight pick mattock, the point of which is thickened by upsetting on an anvil, then split nearly to the eye to form a slim tapered fork. The mattock blade is either left unchanged except for a slight shortening to balance the tool, or twisted through 90° for use in chopping.

Various sizes and types of the claw mattock were tried out in the Sugar Pine Region during the past season. In Oregon, about 20 of the Idaho-type tools were tried and found to be highly satisfactory for rework; they were not, however, generally accepted for initial eradication. On the Plumas National Forest the claw mattock (Idaho type) was given a limited trial and proved effective on small bushes.

A similar type tool was designed for use in the southern part of the Sugar Pine Region where large R. roezli predominate. The heavy 6-pound pick mattock used as the standard eradication tool was converted into (1) a short pronged claw-mattock by thickening the point and splitting, and (2) a long claw by welding on an extra prong. To facilitate gripping the Ribes root, both tools employed a slim taper to the fork and had the inner edges of the fork beveled, similar to the bevel on a claw hammer. Some workers preferred the long edge of the bevel on the inner curve of the tool head because this design added a self-cleaning feature without impairing the tool's gripping quality.

The Park Service personnel engaged in blister rust work under the supervision of F. A. Patty proved to be especially active in the development of new types of tools. Several were made and tried out, and of these, three were successful enough to warrant description: (1) The "French tool" (named after the designer) was made of 3/16-inch tool steel. The cutting blade and the claw were made as separate units and bolted to an adz or pick handle. (2) The trench mattock was revamped by splitting the mattock blade to form a claw and converting the point to a narrow blade. Additional steel was welded to the eye for greater strength and a standard handle was turned to fit. (3) The trench mattock was converted to claw and pick point for use on R. tularense, and on bushes growing in rock crevices, where it proved very effective.

For the eradication of large bushes, a worker under Arthur London on the Sierra National Forest, designed a puller consisting of a heavy bar about 7 feet long, curved and forked at one end; attached to the curve is a flat shoe with pivot fulcrum. Bushes could be pulled readily, but the weight of the tool (30 lbs.) and long handle made hand transportation and work in dense brush difficult. This tool was also tried out in Yosemite National Park, where it was remodeled to suit the individual operator.

Summary of the 1939 Tests with New Tools

The small claw mattock of various types proved popular with the crewmen, but the heavy forked tool tried out on the Sierra National Forest, the home of large Ribes, was not generally accepted. A large R. roezli sometimes requires considerable loosening with the pointed end of the tool before one man can pull it; for this work the claw point was less effective than a regular pick point. However, under favorable conditions of soil and brushy growth, the large claw mattock was used by some workers to good advantage.

In the Sugar Pine Region, the tool with the ax blade is not as satisfactory as the one furnished with the mattock blade. When chopping is necessary it can be best done with a Pulaski. The claw mattock is primarily a prying tool and the flat blade provides a more solid foundation than the edge of an ax blade which tends to sink into the ground. Owing to the diversity of eradication problems in the Sugar Pine Region there seems to be small hope of developing an all-purpose tool; the present types of claw mattocks and claw picks have proven successful on small bushes and for rework. In the national parks where CCC labor is used entirely for Ribes eradication, the claw-type tools are rapidly being accepted and are considered superior to the pick mattock.

Present plans call for the construction of several hundred claw mattocks of various sizes for use in 1940, and for further developmental work with these tools.

Use of Safety Ropes in Ribes Eradication Work Undertaken in Hazardous Areas

Steep slopes and perpendicular cliffs have sometimes introduced special hazards in Ribes eradication work undertaken in the Sugar Pine Region. Ropes have been used to enable the workers to reach the Ribes bushes and to work in safety. In the past, the volume of this type of work has not been large but with the rounding out of control unit boundaries, the extension of work to higher altitudes, and the progress of work southward in the Sierras, there will be an increasing need for rope work.

On the Marble Fork of the Kaweah River, Sequoia National Park, California, the steep slick granite faces and the sheer perpendicular cliffs made eradication work a hazardous undertaking. A crew of 10 men and a foreman was each equipped with 200 feet of rope, a cutting tool, and a canteen of Diesel oil. All workers were taught to tie a safety hitch in the rope, and by using trees as anchors they were able systematically to work the area. Bushes which could not be dug were eradicated and the crowns drenched with oil.

Considerable rope work has been done on the Rogue River National Forest, Oregon, and a limited amount on the Plumas and Sierra National Forests in California.

The proposed eradication of Ribes on the inner rim of Crater Lake, Crater Lake National Park, Oregon, will require the use of ropes and cables. Further work in the Sequoia National Park will involve some hazardous areas and the conduct of blister rust control in the white pine and white bark pine

types of the high Sierras will necessitate rope work.

Various hitches, knots, and slings have been adopted or devised by the workers to ensure their safety while engaged in eradication on precipitous slopes or cliffs.

For the promotion of the safety of workers carrying out hazardous assignments, a report will be compiled on the various safety devices in use. This report, Serial No. 105, is now being prepared at Berkeley and copies will be available early in 1940.

LABORATORY AND GREENHOUSE WORK, NOVEMBER 1938 TO APRIL 1939

Laboratory and greenhouse work undertaken at Berkeley during the winter of 1938-39 included: (a) routine care of the Ribes Garden and the greenhouse; (b) continuation of Ribes seed germination tests; (c) examination of chemical and physical properties of mulches formed by Ceanothus sp., Manzanita sp., and Chinquapin sp.; (d) final revision of the methods bulletin. Reference should be made to the following reports for details of these special activities at Berkeley:

Serial No. 97
The longevity of Ribes seeds. Details of experiments in progress.
.....C. R. Quick

Serial No. 98
Manual for care of greenhouse, Ribes Garden, etc.,
.....C. R. Quick

Serial No. 99
Experimental germination of Ribes seeds. Series of 1936.
.....C. R. Quick

Serial No. 100
Experimental germination of Ribes seeds. Series of 1937.
.....C. R. Quick

Serial No. 101
Experimental germination of Ribes Seeds. Series of 1938, with a report on culture methods now used.
.....C. R. Quick

Serial No. 102
Occurrence and growth of Ribes in brush.
.....C. R. Quick

Serial No. 103
Precipitation in the Sierra Nevada, growth rate of conifer saplings, and the distribution of Ribes.
.....C. R. Quick

Papers published during 1939 include:

"Ribes tularense (Cov.) Fedde in Sequoia National Park", C. R. Quick. Madroño 5 (1939) 3: 103-104

"Herbicide". H. R. Offord, U. S. Patent No. 2,173,236. Sept. 1939.

"Chemical and mechanical methods of Ribes eradication in the white-pine areas of the Western States". H. R. Offord, G. R. Van Atta and H. E. Swanson. U. S. Dept. of Agric. Tech. Bull. 692, 4 pp. illus. (1939)

RECOMMENDATIONS FOR THE USE OF SPECIAL METHODS AND EQUIPMENT IN PRACTICAL RIBES ERADICATION WORK

New Hand Tools for Ribes Eradication

Claw mattocks or claw picks made from light or medium weight stock are recommended for rework or initial work provided the bushes are not too large to permit effective utilization of the prying features of the new tools. The diversity of Ribes forms occurring within the sugar-pine areas indicates that several patterns of the claw tool will finally be used in practical work. Further tests with claw tools are planned.

Dynamite

Dynamite has been used to effect substantial reduction in the cost of eradicating large or troublesome Ribes bushes, e.g., those having 3,000 feet of live stem or more. The following materials are needed by a dynamite crew: 20 percent dynamite sticks 1-1/4 inches by 8 inches, half-pound size; portable blasting machine; 200 feet of double blasting wire; and a supply of electric blasting caps with 6-foot connecting wires. Two men make up an effective crew for the blasting work. Additional crewmen should be used as needed for mop-up work. Dynamite is recommended in the following instances:

(1) For R. cereum having 3,000 feet of live stem or more (see Fig. 5 and Table 5 for detailed data).

(2) For large R. nevadense especially when intermingled with dense brush.

(3) For isolated clumps of R. inerme in association with willow or alder.

(4) For any Ribes buried under soil and rock along road fills and railroad grades.

(5) Special ditching powder may be used to drain swampy ground in connection with camp construction or the operation of mechanical equipment.

Recommendations (1) to (3) above are not intended to apply if mechanical power equipment can be used.

Decapitation and Chemical Treatment of Ribes

This is an auxiliary method to the standard practice of grubbing and should be reserved for troublesome Ribes whose crowns and roots are embedded in rock crevices, under rock, logs, or tree roots.

Equipment and chemical. - When only a few bushes per day are treated and the Ribes is a single-crown species and is not unusually large, e.g., R. viscosissimum, R. nevadense, R. cruentum, R. lobbii, R. watsonianum, and R. lacustre, carry 2-ounce charges of a mixture of dry borax and sodium chlorate (5:1) packaged in half-pound Kraft paper bags loaded in the Army-style, 9-pocket cartridge belt. When a comparatively large number of bushes are treated, all of the above Ribes species including R. roezli and R. cereum may be treated with oil. Carry Diesel fuel oil in 2-quart canteens or in 5-gallon knapsack tank, depending upon the volume of oil needed and the ruggedness of the country.

Method of decapitation and treatment. - The Ribes bush should be cut off through or below the bulbous portion of the crown. Apply dry chemical or oil so that all exposed crown tissue is liberally covered. Complete coverage is essential to successful treatment. The Pulaski or long-handled pruning shears is a convenient tool for decapitating Ribes. A dosage of at least an ounce of oil or dry chemical will be needed for the smaller crowns. Do not cover the treated crowns with dirt.

The Use of Oil Sprays on Intact Ribes

Spray R. roezli seedlings (preferably not more than 2-year-old plants) with an oil mixture consisting of 4 parts of Diesel fuel oil 27° - 29° Be., and 1 part of SO_2 extract. The SO_2 extract is a waste product in the refining of lubricating oil and is obtainable from any oil refinery. Specifications for the SO_2 extract are given on page 89 of the 1938 annual report. Treatment should involve complete coverage of aerial plant parts plus crown application to the point of puddling. Expressed in terms of practical lethal dosage, the treatment just described should be based on the use of 3 gallons of oil for each milacre fully populated with Ribes.

The 5-gallon knapsack tank with trombone double-action hand pump or the 3-gallon compressed air sprayer should be used for carrying and applying the oil. Oil resistant hose connections and washers should be used on all equipment.

Bulldozer Methods

(1) The 50-60 horse power track-laying tractor equipped with the Ribes brush rake should be used for the clearing of R. inerme and brush from alluvial bottom land. This method involves piling and burning of all brush and should preferably include subsequent seeding of the area to grass.

(2) The 25-horse power track-laying tractor should be used in upland sites for the eradication of heavy concentrations of R. roezli and R. cereum where these bushes occur in comparatively open sites. The complete

unit is equipped with the front end Ribes brush rake sheave block and rear-end logging winch for operating special 30- to 40-pound Ribes hooks.

The tractor need not be equipped with the front end brush rake (see pages 155 - 165 of this report for details of equipment and results of the first year's tests with the small bulldozer).

Horse-drawn Hooks

Special hooks (see pages 102 and 103 of the 1938 annual report, and page 118 of this report) may be operated by a team of large horses for open-grown R. cereum and medium-sized R. roezli. Further work is needed to define the scope and limitation of horse and tractor work. Data now available show that horses may be used on open-grown, medium-sized bushes, especially on R. cereum, under conditions similar to those encountered in the pumice flats of Rogue River National Forest, Oregon.

Use ropes and safety slings to facilitate removal of Ribes on cliffs and steep rocky slopes. (See special report, Serical No. 105, for illustrations of rope work).

PART V - Section 2

RIBES ECOLOGY IN CALIFORNIA, 1939

By

Clarence R. Quick, Assistant Pathologist

Previous annual reports on ecological studies undertaken in the Sugar Pine Region mainly consisted of current data on plots which necessarily must run several years before their full value can be determined. It has been planned to present full summaries of ecological data relative to specific plots and studies whenever the data warrant more lengthy and detailed treatment. This year such a summary report is presented on the 1.6-acre Ribes seedling occurrence plot initiated in 1930 on Cow Creek, Stanislaus National Forest, by F. A. Patty. The remainder of the report contains current field data on the following topics:

(1) Occurrence of Ribes seedlings on eradicated areas.

(2) Survival and growth of seedlings on eradicated areas.

(3) Occurrence and growth of Ribes seedlings on burns.

(4) Cow Creek 10-acre Ribes regeneration plot.

(5) One-acre Ribes regeneration plots.

Summary of Data from Cow Creek Seedling Occurrence Plot

The plot was initiated in 1930 by Frank A. Patty, then in charge of ecological work in the Sugar Pine Region. Excerpted portions of his annual report for 1930 (Annual Report, B.R.C. in the Far West, 1930, pp. 187-188) follow:

> "This study was begun early in September 1930 after the Ribes fruits had ripened, to determine how many years elapse after an eradication before the year of maximum germination is reached.* * *
> * * * This particular site was selected because it was known that there were thousands of Ribes seed present on the plot.* * *
> * * This was also considered an excellent site for Ribes due to the soil, moisture, and shade conditions.* * *
> "A total of 1,451 R. roezli, 23 R. nevadense, 1 R. cereum, and 1 R. viscosissimum bushes were removed from the 1.6-acre plot. The R. roezli bushes contained 35,620 feet of live stem and 37,815 fruits. The 25 other Ribes were not producing fruit. It is estimated that the 1,451 R. roezli bushes produced 1,510,000 seeds in 1930. This estimate was obtained by multiplying the number of fruits by the figure 40 which proved to be the average number of seeds per fruit for 2,000 R. roezli fruits which were collected in the vicinity."

The plot was studied by F. A. Patty during the period 1930-1932. George A. Root took data for the plot during the period 1933-1936. The writer assisted Root in 1936, and has been in immediate charge of the work since 1936.

In 1937 the plot was resurveyed because the end corner stakes nearest the creek became lost. Figure 1 shows the plot with the boundaries that are now recognized. The 0.09-acre portion at the north end with the dotted boundaries appears to have been "lost" from the original plot area prior to 1936, and the area has not been checked since the writer was concerned with the plot. In 1937 the plot was divided into seven subplots of unequal size. Although ecological conditions varied among subplots they were uniform for all practical purposes over any single plot. All of the resurveyed plot was checked in 1937; since 1938, only five of the seven subplots have been studied. The two neglected subplots are the most brushy, were the least disturbed in logging, are the farthest from the creek and the highest up the slope, and produce far fewer Ribes per acre than the five checked subplots. It is believed that the objectives of the original study will be achieved by checking less than the whole of the plot. If time permits occasional checks of the subplots on the south end will be made in the future.

Location and description. The best way to find the plot, for one unfamiliar with its location, is to go to the blister rust control camp site on Cow Creek in the NE 1/4 of sec. 34, T. 5N., R. 18E., Mt. Diablo B & M. This camp site is on the dirt road up Cow Creek which leaves the Sonora Pass Highway near Airola Cabin about a mile and a quarter south of the Cow Creek Guard Station, and is near the first bridge over the main stream of Cow Creek 2 to 2.5 miles from the highway. From the camp site, go back down the road toward the highway about a quarter of a mile to a small bridge of railroad ties over a perennial lateral stream. From this stream proceed on down the road about 4.3 chains. On the bank of the cut on the south edge of the road, below an old rotting stump, is a sizable stake around which rocks have been piled. This stake is the present northeast corner of the plot, and is shown in Figure 1.

The plot lies on the gentle westerly- and northwesterly-facing slope just southeast of the creek. The area was logged in 1925 and was badly abused in the process. That part of the plot nearest the road was used as a loading zone during logging. The main line of the Cow Creek logging railroad and a short loading spur both crossed the plot. The main line, subsequent to the plot's initiation in 1930, was changed into a road by the Forest Service.

The plot lies towards the upper limit of the Sierran Transition Life Zone at an altitude of about 6,200 feet. Just northeast of the plot on a northerly-facing slope along a branch of Cow Creek, occurs considerable red fir (Abies magnifica Murr.) one of the index species of the Canadian Life Zone, the zone next above the Transition Zone in altitude. The plot, originally a dense stand dominated by sugar pine (Pinus lambertiana Dougl.) and red fir, now supports a thin residual stand of red fir, white fir, (Abies concolor Lindl. & Gord.), yellow pine (Pinus jeffreyi Balf.), sugar pine, and incense cedar (Libocedrus decurrens Torr.). The upper end of the

FIGURE I.

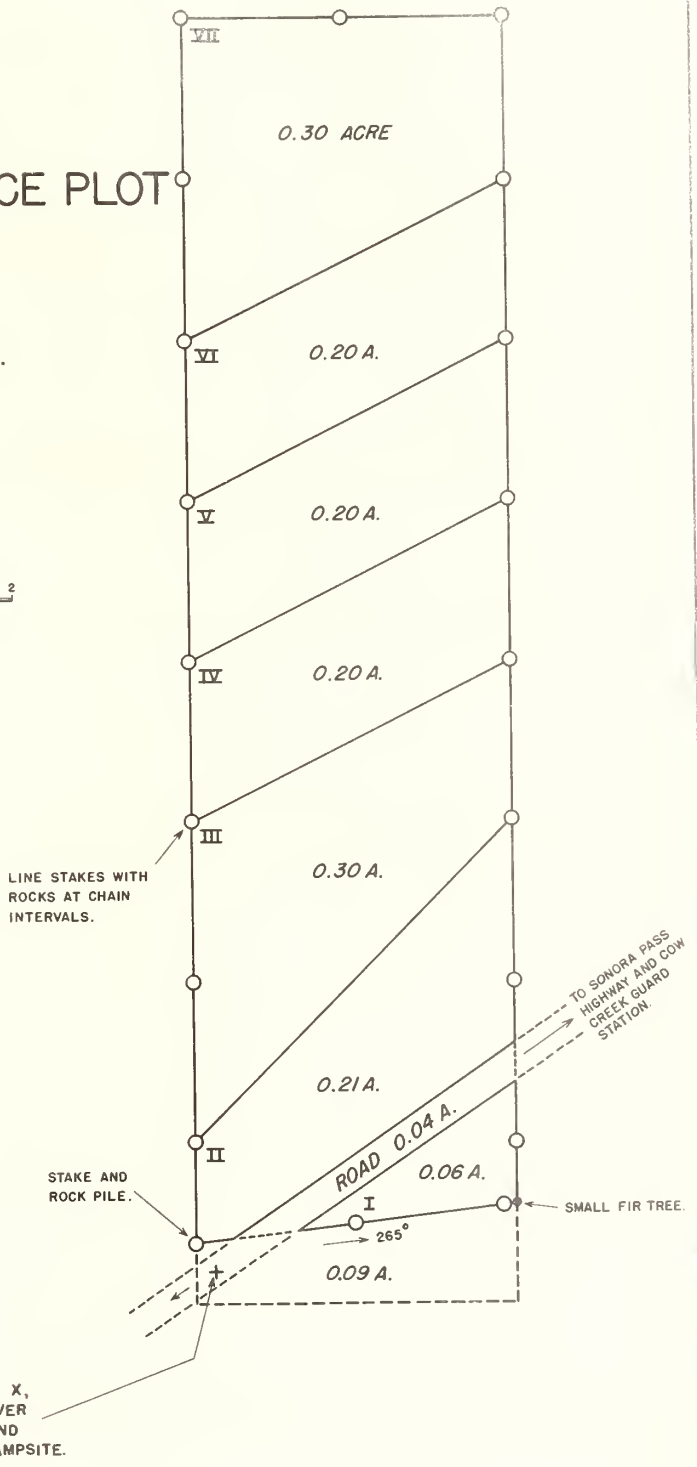
COW CREEK SEEDLING OCCURRENCE PLOT

NE¼, SEC. 34.
T. 5N, R. 18E.
1.6 ACRES ORIGINAL AREA.
ESTABLISHED IN 1930.

SUBPLOTS AND ACREAGES AS SHOWN.

APPROXIMATE SCALE
0 2
CHAINS





H.E.C.

C.R.O. 1E-13-38

plot is now exceedingly brushy, and apparently was somewhat brushy even when the plot was established. The brush, mostly white-thorn or snow-brush (Ceanothus cordulatus Kell.), is gradually increasing in extent and density on the plot. A thin coniferous reproduction has become established in the 14 years since logging and may eventually shade out part of the brush.

The iex ("isophane equivalent index") of the place (see Hopkins, A. D. --Bioclimatics, 1938) is 46.00°, the pi ("position isophane") is 34.25°, and the ei ("equivalent isophane") is 49.75°. These values are based on the following figures: latitude 38.24° N., longitude 119.97° W., and altitude 6,200 feet.

The plot lies in the path of moisture-bearing winds crossing from the main canyon of the Stanislaus River, a major wind channel in the region, to other wind channels to the eastward. The topography at this point forces the wind currents to rise rapidly. In consequence the area has a somewhat higher average relative humidity, and receives a greater total precipitation than similar areas not located in such wind channels.

Results of study. References to this plot in the several Blister Rust Control annual reports are as follows: 1930, pp. 187-188; 1931, pp. 255-257; 1932, not reported; 1933, p. 167; 1934, p. 141; 1935, not reported; 1936, pp. 240-241; 1937, p. 138, and p. 141; and 1938, p. 110.

Tables 1 to 3 inclusive summarize certain of the data collected on this plot from 1930 through 1939. The data are somewhat "patchy", and at times even inconsistent, but are well worth reporting in summarized form. During the past several years, considerable time has been spent on the plot in determining the years of origin of seedling-origin plants, and these data are reasonably accurate.

It is apparent from Tables 1 to 3 that, under field conditions where this plot is located, the supply of R. roezli seed stored in the soil is not being depleted with any encouraging rapidity. It is true that a few lightly fruiting bushes have remained on the plot, but such bushes could cause only a very small fraction of the observed seedlings. The higher south end of the plot is now extremely brushy, and thinly populated with Ribes. The area up the slope south of the plot supports few Ribes and is very brushy, and apparently few if any Ribes seeds have been washed down the slope onto the plot. The areas to the sides of the plot, in spite of repeated regular eradications, have contained a scattering of fruiting R. roezli bushes. Such bushes, however, could not be the seed source for the large annual crops of new seedlings. From these data it must be concluded that large numbers of viable R. roezli seeds may be stored in forest soil for rather lengthy periods. It is true that the number of gooseberry seedlings appearing each year has declined greatly, but the seedlings still appearing are numerous enough to necessitate repeated inspections and rework in the future.

The several factors pertaining to the Ribes population and the site -- the very severe ground disturbance during logging, the repeated disturbance caused by the eradication work which must be done to keep ahead of fruiting bushes, the greater than average moistness of the area, the high grazing intensity by cattle due to proximity of the stream, road, and a

salting area, and the very dense population of abundantly fruiting Ribes originally removed from the area -- all conspire to make the area one of the most troublesome eradication problems in the Sierra Nevada. It is most fortunate that such areas are usually small in size and of rather infrequent occurrence. With the establishment of the rust on an area of this sort, the area would probably have to be worked over at least once a year during the primary stages of Ribes suppression.

The extreme difficulty of accomplishing 100 percent elimination of Ribes from very brushy areas is clearly apparent in the data. The 1937 check and eradication work over the area were undertaken with meticulous care by the writer working alone. The 1938 check was the only one, as far as I am aware, that has disclosed no fruiting bushes on the plot.

The difficulties experienced by a skilled and interested worker in removing all of the Ribes from even small areas of brush provides an index of the degree to which it will be possible to eliminate Ribes from brush fields by the use of regular crew labor. Statements regarding the protection of pine in and immediately adjacent to brush fields which originally contained many Ribes should be made with due care until we know more about the spread and intensification of rust from small missed Ribes growing under the protection of the brush.

The association of intense Ribes regeneration and good sugar pine reproduction on logged or burned areas in the central and southern Sierra Nevada is so consistent that the writer believes it possible to judge the approximate quality of sugar pine site by the number and vigor of Ribes roezli plants on the area. That the two species have very similar habitat requirements for optimum growth is one of the least encouraging aspects of the blister rust control program. In extreme cases it may well mean that, on areas peculiarly suited to growth of both sugar pine and gooseberries, the present crop of sugar pine reproduction may be partially or entirely killed by the rust. Then, after the Ribes have eventually been eliminated, such areas will have to be reseeded or replanted to sugar pine. The procedure would be in accord with the old Blister Rust saying that control areas should be chosen by a consideration of the "sugar pine site," and not alone by a consideration of the "sugar pine in sight."

The frequency and size of these areas of numerous and aggressive Ribes on badly disturbed areas apparently increase steadily as one goes south in the Sierra Nevada. For this reason the writer believes that the chances of complete rust exclusion from the more southerly control areas is less probable than from areas to the north, in spite of the present considerably greater distance of these areas from the rust. Perhaps where these high risk areas lie on or near the boundary of a control unit, the simplest and most satisfactory solution might be to exclude them temporarily from the control area. Some maximum standard of Ribes vigor and density might be established for cut-over areas under consideration for protection. Areas with more abundant or more numerous Ribes than such a standard, unless such areas had value other than sugar pine reproduction on the ground, would be left until less questionable areas were adequately protected.

The Ribes data reported in the appended tables are to be considered as close approximations, although all plants on the plot older than current season seedlings have been counted with hand tallies or by tallying them on data sheets as they were found. The relative speed of determining bush ages for large numbers of small and slow-growing plants was such that some error may have crept into the age determinations. It should not be assumed that the older bushes reported, because of their age, are necessarily large bushes. The age of a bush is determined by the number of annual growth increments on one or more of its principal stems, and not by its size. In the brushy parts of the plot many plants have been found which averaged one inch or less of live stem increment per year. A year-old plant is often distinguishable from a current season seedling only by its hardened stem, a rather indistinct ring of terminal bud scars, and a lack of cotyledons. The recording of paired items of data (size and age) on all plants older than current season seedlings would perhaps be more statistically sound, but would take a great deal more time than has been available in the past for work on the plot. The data from certain smaller seedling occurrence plots in the same region have been recorded in considerably more detail.

In Table 3 some data are presented to show the survival of seedlings through their first growing season and the following winter. Perhaps the most noticeable thing is that the estimations of current season seedlings have been too low. Since 1936 all data on year-olds have been collected on hand tallies and are more accurate than the carefully estimated data for current season seedlings. Some very small 2-year-olds may have been included with the year-olds.

The data in Table 3, when extended by several more years of work, should show what correlation should be expected between seedling occurrence and survival and meteorological data.

Occurrence of Ribes Seedlings on Eradicated Areas

For previous reports relative to this work see the annual report for 1938, pp. 110, 112; and for 1937, pp. 137-139, 142.

During 1939 this study was expanded to include five more milacres on Chowchilla Mountain, Sierra operation, and a set of ten milacres near Markwood Meadow, Shaver Lake Region, Sierra operation. In 1938, four of the ten Spanish Ranch Ridge milacres were used to study Ribes seedling growth rate and survival. This year these milacres were cleared of Ribes, and will be used hereafter as seedling occurrence plots only.

The tract on which the ten Markwood Meadow milacres were established is situated in sec. 3, T. 10S., R. 25E., Mt. Diablo B & M. No eradication has yet been performed on the section. A sawmill, situated on a tongue of timbered land south of the meadow and north of the Shaver Lake-Dinkey Creek highway, operated on the site for several years, but closed down and moved away in September 1937. The area was very badly disturbed by logging and milling operations. A thin residual forest consisting of white fir, sugar pine, and incense cedar, and many large stumps remain on the area. The soil is loose and friable to a considerable depth, and has developed from disintegrated granite. The 1938 crop of seedlings of Ribes roezli, Ceanothus cordulatus, Arctostaphylos patula, and so forth, was large and vigorous.

Table 4 reports the seedlings of Ribes, sclerophyllous brush, and conifers found on the milacres. The few annual and perennial herbs were not recorded. No white fir, sugar pine, or yellow pine seedlings were found. As far as could be determined most of the brush seedlings were, like the Ribes seedlings, of 1938 origin. The scarcity of 1939 seedling-origin plants is readily explained by the presence on the area of many large and rapidly growing 1938-origin seedlings of perennial species and by the late season check. The better established bushes, particularly in such dry summers as 1939, are able to reduce soil moisture in the layers where roots of smaller seedlings are located to such a extent that current season seedlings are nearly or quite excluded. A large crop of 1940-origin Ribes and other seedlings is expected because of the removal of the 1938-origin plants.

The five milacres added to the study on Chowchilla Mountain are in the same area as the ten initiated in 1938. This area was briefly described in the 1938 annual report. In addition to the 10,305 current season seedlings removed from the five new milacres, as shown in Table 5, the following older seedlings were also removed: 1938 origin, 22; and 1937 origin, 8. Forty year-old seedlings were removed in 1939 from the ten milacres initiated in 1938.

One milacre of the 1938 Chowchilla Mountain series had 4,246 seedlings (1938, 3,112; 1937, 1,119; and 1936, 15) removed from it at initiation in July 1938. This same milacre had 2,120 current season seedlings removed in June 1939. Thus, in two years a single milacre has produced 6,366 Ribes seedlings.

Plots E and F (24 milacres), Chowchilla Mountain, are used to study survival as well as the occurrence of seedlings on protected areas. At each annual check the current season Ribes seedlings are carefully estimated and left on the ground, while the year-old seedling-origin plants are pulled up and counted. On July 25, 1938, some 3,460 current season seedlings were left on these two plots, and on June 23, 1939, 805 year-old seedlings were removed. During the period just mentioned, the survival in this area where no older Ribes seedlings were present, is therefore about 23 percent. Parts of these plots are bare, while other parts have some snow-brush and herbs on the ground.

The Cow Creek milacres produced this year far fewer Ribes seedlings than formerly. Unless more seedlings are produced in subsequent years it appears that the seed supply on this area is rapidly approaching exhaustion. This same conclusion appears to hold for the ten Spanish Ranch Ridge milacres (see Table 5).

Plot B (28 milacres), Cow Creek area, Stanislaus National Forest, was checked in June. The numbers of seedlings removed from this plot (678 CSS, 94 of 1938 origin, and 2 of 1937 origin) are far below the numbers found in 1938.

Survival and Growth of Seedlings on Eradicated Areas

For previous material on this topic, see annual reports: 1938, pp. 111, 113, 114; and 1937, pp. 131-136.

This study consists of a series of small plots on which seedling-origin Ribes bushes are inspected from year to year for survival and growth rate. Vegetation maps have been made for most of these plots, and after several more years a summarization of data should give valuable leads concerning the effects of plant competition on Ribes survival and growth, and should show also the effects of meteorological factors on survival and growth. It is proposed to submit annual progress reports on these plots until such time as detailed summary reports are in order.

Table 6 presents survival data, and Table 7 submits growth rate data collected from this group of plots.

The last entry in Table 7 and the whole of Table 8 deals with twelve exceedingly vigorous R. roezli plants removed from the site of the old Peterson mill, just south and west of Markwood Meadows, and north of Blue Canyon, near Shaver Lake, Sierra National Forest, California. This mill, previously operated for a number of years, was abandoned in September 1937. Most of the plants of Ribes and other brush species date from the spring of 1938. The exceedingly rapid growth of these plants has been due to severe disturbance of the soil around the saw mill and mill yard, lack of competition from trees and older shrubs on the cleared area, and idleness of the ground for several years. Additional growth rate and fruiting data will be collected from this locality in 1940.

If this growth rate record is representative of severely disturbed areas in the extensive region around the head of Blue Canyon, and if the whole area is to be protected from blister rust, then ultimate control on

this area will be expensive, time consuming, and troublesome. If a Ribes seedling will attain a live stem size of two to ten feet in its first season, and if a year-old plant will add twenty to a hundred and sixty feet of live stem during the second season, the necessity for frequent and careful rework is at once apparent.

It was originally planned to make detailed measurements of growth rate for all fruiting bushes removed from plot G, a plot of 24 milacres contiguous to plots E and F on Chowchilla Mountain, Sierra National Forest. Initial eradication was performed on this plot in 1935; the plot has not been reworked by regular eradication crews. A great many fruiting bushes were found in June 1939, and sizes of the bushes were estimated rather than measured in detail. Ten fruiting R. roezli bushes bearing a total of 308 feet of live stem and a small but undetermined number of fruits were removed from these 24 milacres on July 26, 1938. On June 24, 1939, 90 fruiting bushes of R. roezli, with an estimated aggregate of 1,655 feet of live stem and 2,100 fruits were removed. It will be interesting to make an annual check of this plot for fruiting bushes.

Occurrence and Growth of Ribes Seedlings on Burns

For previous submitted material on this topic, see the annual report for 1938, pp. 111-112, and 115.

During the fall of 1937, a small spot burn with an area of about 1.5 square chains occurred in the Manzanita-Ceanothus brush in the logged area a short distance east of the Cow Creek Guard Station. This small burned area, now a plot, is located in the S 1/2 of the SW 1/4 of sec. 34, T. 5N., R. 18E., near the northwest corner of the 1936 Ribes-in-brush plot, and about two chains west of the dirt road up Cow Creek. Previous to the burn the spot was covered with open brush and bear clover under a thin residual stand of young mature yellow pine and sugar pine. A few Ribes plants were scattered in the brush. During the fire, the Ribes, the several species of brush, and the conifer reproduction were charred down to ground level. The Ribes and the conifer reproduction were killed. None of the sizable trees were killed outright. Many plants of some species, especially ground rose (Rosa spithamea), waxberry (Symphoricarpos mollis) and bear clover (Chamaebatia foliolosa) resprouted immediately and vigorously. Some plants of Manzanita (Arctostaphylos patula), snow-brush (Ceanothus cordulatus), and deerbrush (Ceanothus integerrimus) also sprouted from their stumps after the fire.

When the plot was first checked on July 12, 1938, 610 current season R. roezli seedlings were counted on the approximate 1.5 square chains of area.

On June 20, 1939, 300 R. roezli plants of 1938 origin, and three plants of 1939 origin were counted on the plot. At this time 68 of the larger and more vigorous 1938-origin plants were staked so that their survival and growth could be followed for a number of seasons.

On August 21, 1939, the plot was rechecked. Growth of the staked bushes was recorded. Table 9 details the bush-size data collected during two inspections of the 68 staked plants. It will be noted that, due

presumably to the severely dry season, fewer bushes in the larger size classes were found in August than were found in June.

Several small mapped plots (aggregate area, 28 milacres) established in 1937 on the burned portion of the 5.6-acre unlogged timber plot just southwest of the Cow Creek Guard Station (California Forest Experiment Station, plot MC #12), were checked twice this year, once in June and again in August. Of the 151 R. roezli seedlings found on June 17, 1939, only four were of 1939 origin, 24 were of 1938 origin, and 123 were of 1937 origin. Table 10 shows the size distribution of the seedling at the two checks.

In addition to the small intensively studied subplots established on the burned portion of this plot which have just been considered, a number of R. roezli plants originating since the fire in 1936 have been staked and studied from year to year. Only those Ribes seedlings have been staked which at the time of inspection appeared likely to become permanently established. Table 11 summarizes the data collected from these 308 staked plants. The general increase in size of these seedling-origin plants can be observed in Table 11. A more detailed presentation of some of the growth data is given in Table 12. In addition to the 308 staked plants on the burned portion, some 115 less vigorous R. roezli seedlings were also observed on the area in June 1939. Some of the staked plants will probably be fruiting in 1940, and fruiting data, in addition to survival and growth-rate data, will then be collected.

The unburned portion of this plot was not checked during 1939.

The 1936 Ribes-in-Brush Plots

These plots were not inspected in 1939.

The 1938 Ribes-in-Brush Plots

These plots were not inspected in 1939.

Cow Creek 10-Acre Ribes Regeneration Plot

For previous submitted material of this study, see the annual reports: 1927, p. 562; 1928, pp. 250, 251; 1929, pp. 216-219; 1930, pp. 189-190; 1931, pp. 256-258; 1933, pp. 167-169; 1934, pp. 141, 142; 1936, pp. 241-242; and 1938, pp. 116, 118.

For the past two seasons only a part of this plot, that is, ten selected square-chain subplots with an aggregate area of one acre, has been checked in detail. During the past season no new bushes were found on these ten subplots and one known bush had died since the check of 1938.

The summer of 1939 was very dry. The apparent vigor of the Ribes plants under consideration, as recorded in Table 13, was considerably less in 1939 than in 1938.

One-acre Ribes Regeneration Plots

For previously submitted material on this project see the annual reports: 1937, pp. 143-145; and 1938, pp. 116, 117.

The two plots established in 1937, that is, the Pilot Peak plot and the Signal Peak plot, were inspected again this year. Three new plots, the Rock Creek, the Blue Canyon, and the Shaver Timber plot were established and given an initial inspection. Due to the very great losses of eradication time to fire fighting during the past season, the Blue Canyon plot (Shaver Lake region, Sierra National Forest) and the Rock Creek plot (Meadow Valley region, Plumas National Forest) were not worked this year by the eradication crews, and consequently they could not be given the usual post-eradication inspection. It is expected that these two plots will be worked next year.

The Shaver Timber plot is located in the NW 1/4 of NE 1/4 of sec. 13, T. 10S., R. 25E. The quarter corner between sections 12 and 13 is located in the open timber just east of the head of the southerly lateral branch of the sizable meadow heading in the south central portion of section 12. An old and somewhat passable road leading to this meadow leaves the highway 0.6 mile southeast of the Shaver Lake-Dinkey Creek summit. From a point 0.5 chain south of the north quarter corner on the north-south quarter line of section 13 the plot extends 10 chains east and 1 chain south. The east-west boundaries of the plot are not straight lines. This is perhaps due to using a compass too close to a steel chain. All boundaries are, however, marked at chain or half-chain intervals by stakes surrounded with rocks.

The plot lies in open mixed unlogged forest containing considerable quantities of uneven-aged advance reproduction. Sugar pine and white fir occur about equally in the mature forest, but the reproduction is predominantly white fir, and tends to occur in thickets mixed with the large, mature sugar pine and white fir trees. The slope of the plot is gentle; the ground slopes westerly on the west end and easterly on the east end. The soil is derived from decomposed granite. There is some brush in open spots in the timber. The brush species, in approximate order of importance on the plot, are: Chinquapin (Castanopsis sempervirens), snow-brush (Ceanothus cordulatus), Manzanita (Arctostaphylos patula), and hazel (Corylus rostrata californica). The main herbaceous perennials at time of inspection were pine violet (Viola lobata), catchfly (Silene occidentalis?), and pyrola (Pirola picta).

The plot was laid out and first checked on July 24 to 26, 1939. At this time, 198 Ribes bushes in addition to seven 1938-origin seedlings, and forty-eight 1939-origin seedlings were counted on the acre. Five of the twenty 0.05-acre subplots were devoid of Ribes. Of the recorded 198 Ribes bushes, 54 were fruiting and 144 were not. The total estimated Ribes live stem on the plot was 4,024 feet, and dead stem, 1,950 feet.

The plot was worked during the summer by regular eradication crews and checked out by the usual procedure. It was then reinspected on September 6, 1939. At this time twelve Ribes plants, with a combined size of only 86 inches of live stem, were found. One bush with 40 inches of

rather bare live stem constituted almost half of the live stem left on the closely-worked acre (see Table 14).

The Pilot Peak plot, given initial Ribes eradication in 1937, was inspected only once during the season inasmuch as the area was not to be worked by eradication crews. Table 14 records the data collected.

The Signal Peak plot, first eradicated in 1937, was checked twice this season, on July 7 prior to, and on September 14 subsequent to, re-eradication. The plot did not meet eradication standards after the 1939 reeradication and was not checked out as being satisfactorily free of Ribes. It is expected that it will be reworked early in 1940. Table 14 summarizes the data collected.

TABLE 1

SUMMARY OF DATA COLLECTED FROM COW CREEK SEEDLING OCCURRENCE PLOT
FIGURES ARE ON A PER ACRE BASIS (DATA TAKEN PARTLY FROM
TABLE 1, P. 241, ANNUAL REPORT 1936)

Date of Check	Acreage of Plot Checked	Current Season Seedlings, Since 1936 Estimated Conservatively and Left on Plot Until 1 Year Old	Percent of Average Seasonal Precipitation July 1 to June 30 4/	Seedling-Origin Plants One to Several Years Old Removed from Plot as Found	Bushes Flowering and/or Bearing Fruits at Check
September 1930	1.60	-	76	1,476 1/	Most
1931	1.60	19,053	67	32	Most?
1933 2/	1.60?	7,549	69	1,406	-
1934	1.60?	8,006	72	311	-
5/26 - 6/5 1936 2/	1.60?	3,813	124	4,284	-
5/26 - 6/5 1936 3/	1.47	4,150	124	4,660	9
6/14 - 6/25 1937	1.47	4,910	111	4,200	5
6/7 - 6/15 1938	0.97 5/	6,340	156	4,560	0
6/13 - 6/20 1939	0.97	4,580	73	7,280	1

1/ Initial eradication in fall of 1930. The few bushes of Ribes other than R. roezli were not fruiting.

2/ Not checked in 1932 and 1935

3/ Figures of 1936 adjusted to area of plot after resurvey of 1937.

4/ Percent of average seasonal precipitation at four weather stations - (Hetch Hetchy, Lake Eleanor, Sonora, and West Point) for the periods July 1, 1929 to June 30, 1930, etc. The figures for the season 1932 are 114, and for 1935, 126.

5/ The 0.97-acre portion checked was the least brushy and the most heavily infected with Ribes.

TABLE 2

TOTAL RIBES PLANTS FOUND ON COW CREEK SEEDLING OCCURRENCE PLOT. CURRENT SEASON SEEDLINGS WERE CONSERVATIVELY ESTIMATED, AND LEFT ON PLOT; OLDER SEEDLINGS WERE REMOVED AS FOUND. FIGURES ARE ACTUAL, NOT ON A PER ACRE BASIS

Year of Seedling Origin	Acreage of Plot Checked, and Dates of Checks as Below				
	1.47 6/5/36	1.47 6/20/37 1/	0.97 6/20/37 2/	0.97 6/15/38	0.97 6/20/39
1930	3	1 4/	1 4/	0	1 3/
1931	11	0	0	0	0
1932	12	5	4	1	0
1933	175	31	21	2	1
1934	1,840	115	103	7	3
1935	4,814	643	629	39	18
1936	6,100	5,386	5,261	277	78
1937	-	7,225	7,015	4,100	755
1938	-	-	-	6,150	6,204
1939	-	-	-	-	4,440
Total Seedlings Removed	6,855	6,181	6,019	4,426	7,060

1/ This column, because of the acreage checked, to be compared with the preceding one.

2/ This column, because of the acreage checked, to be compared with the following two.

3/ This bush originated in 1928, but was not fruiting.

4/ This bush was non-fruiting R. cereum, with live stem of about six inches.

TABLE 3

SURVIVAL OF CURRENT SEASON SEEDLINGS, (CSS), ON FIVE SUBPLOTS. DATA ARE ON A PER ACRE BASIS, TO THREE SIGNIFICANT FIGURES

Type of Seedling and Date of Check	Subdivisions of Plot (See Map). Number of Subplot and Acreage as Shown					
	I	II	III	IV	V	I - V
	0.06	0.21	0.30	0.20	0.20	0.97
CSS* Estimated, 1937	1,420	5,740	8,530	12,630	3,200	7,230
Year-olds Removed, 1938	2,270	2,830	5,580	5,950	2,550	4,230
CSS* Estimated, 1938	2,500	6,190	8,170	7,750	3,500	6,340
Year-olds Removed, 1939	4,760		8,190	9,000	3,270	6,390
CSS* Estimated, 1939	3,330		4,970	7,750	2,500	4,580

* Estimated conservatively and left on the plot.

TABLE 4

SEEDLINGS FOUND ON MARKWOOD MEADOW MILACRE SEEDLING OCCURRENCE PLOTS
SEPTEMBER 1, 1939

Milacre Number	Ribes Seedlings Removed from Plot Species and Year of Origin as Shown				Total Ribes Seedlings Removed in 1939	Sclerophyllous Brush Seedlings Removed from Plot		Tree Seedlings Left on Plot	
	R. roezli		R. nevadense			Snow-brush (Ceanothus cordulatus)	Manzanita (Arctostaphylos patula)	Incense Cedar	Lodgepole Pine
	1939	1938	1939	1938					
1	5	128	-	-	133	-	18	1	-
2	1	87	1	-	89	-	3	-	-
3	1	46	-	-	47	25	3	-	1
4	2	32	-	-	34	41	4	-	-
5	-	31	-	-	31	32	3	1	-
6	2	48	-	1	51	17	2	-	-
7	2	29	1	2	34	27	3	2	-
8	-	31	-	-	31	28	1	-	-
9	2	69	-	4	75	15	1	4	-
10	3	50	1	-	54	14	1	-	-
Total	18	551	3	7	579	199	39	8	1

TABLE 5

SUMMARY OF CURRENT SEASON RIBES SEEDLINGS FOUND ON MILACRE SEEDLING-OCCURRENCE PLOTS ON ERADICATED AREAS

Milacre Number	Current Season Ribes Seedlings Found on Dates as Shown						
	Chowchilla Mountain, Sierra National Forest				Markwood Meadow Milacres Sierra National Forest	Cow Creek Campsite Milacres Stanislaus National Forest	Spanish Ranch Ridge Milacres Plumas National Forest
	Old (1938) Milacres 6/22/39	New (1939) Milacres 6/22/39	Plot E 6/23/39	Plot F 6/24/39	9/1/39	6/12/39	6/2/39
1	451	1,887	860	75	5	5	12
2	557	1,021	420	45	2	57	80
3	1,405	2,057	185	145	1	51	7
4	420	3,412	370	55	2	7	18
5	440	1,898	320	75	0	12	94
6	162	-	105	85	2	43	10
7	75	-	230	125	3	26	17
8	77	-	285	140	0	3	17
9	312	-	145	175	2	4	40
10	2,120	-	385	100	4	104	36
11	-	-	360	295	-	-	-
12	-	-	430	235	-	-	-
Total	6,019	10,275	4,095	1,550	21	312	331

TABLE 6

SURVIVAL OF SEEDLING-ORIGIN RIBES ON CERTAIN PLOTS ON ERADICATED AREAS

Plot Designation	Date of Check	Number of Plants on Plots on Dates and by Years of Origin as Shown								
		1939	1938	1937	1936	1935	1934	1933	1932	Totals
Plot A [2] Stanislaus 30 milacres	6/10/37	-	-	938	126	72	12	2	-	1,150
	6/12/39	171	152	233	118	25	6	-	-	705
Plot C Stanislaus 21 milacres	7/11/38	-	1,073	816	87	25	5	1	-	2,007
	6/9/39	957	839	401	72	14	5	-	-	2,288
	6/9/39 [1]	-	-	-	-	1	4	-	-	5
Plot D Stanislaus 4-7/8 milacres	6/28/38	-	66	6	1	2	1	-	-	76
	6/16/39	8	12	4	2	2	1	-	-	29
	8/22/39	2	6	2	2	2	1	-	-	15
Butt Creek #1 25 milacres	9/13/38	-	540	62	32	25	4	4	-	667
	9/13/38 [1]	-	-	-	-	5	3	4	-	12
	6/1/39	114	325	40	27	17	4	1	-	528
	6/1/39 [1]	-	-	-	1	3	4	1	-	9
Butt Creek #2 24 milacres	9/13/38	-	364	46	4	10	10	3	-	437
	5/31/39	119	285	28	5	9	8	3 [3]	-	457
Spanish Ranch Ridge 4 milacres	9/15/38	-	28	39	77	31	10	-	-	185
	6/2/39	138	19	29	58	41	13	2	1	301

[1] Plants fruiting; removed and measured for growth rate.

[2] Not checked in 1938.

[3] One fruiting; removed, and measured.

TABLE 7

GROWTH RATE OF CERTAIN RIBES ROEZLI BUSHES REMOVED FROM PLOTS AND STUDY AREAS DURING 1939

Plot Designation	Date Plants Removed	Year of Plant Origin	Number of Plants Averaged	Average Linear Feet of Live Stem Per Bush, By Years of Growth							Total Average Size Feet of Live Stem
				1939	1938	1937	1936	1935	1934	1933	
Plot C Stanislaus 1/ 21 milacres	6/9/39	1935	1	2.0	3.6	2.3	0.8	0.1	-	-	8.8
	6/9/39	1934	4	4.3	6.8	2.4	1.1	0.3	0.1	-	15.0
Butt Creek #1 1/ 25 milacres	6/1/39	1936	1	7.1	6.2	0.2	0.1	-	-	-	13.6
	6/1/39	1935	3	4.9	8.0	1.7	0.2	0.1	-	-	14.9
	6/1/39	1934	4	1.4	5.9	1.5	0.7	0.4	0.2	-	10.1
	6/1/39	1933	1	0.2	7.3	3.6	0.5	0.1	0.1	0.1	11.9
Butt Creek #2 1/ 24 milacres	5/31/39	1933	1	0.2	8.4	3.6	0.7	0.5	0.1	0.2	13.7
Markwood Meadow Mill Site Area	9/8/39	1938	12	56.7	2.9	-	-	-	-	-	59.6

1/ Bushes removed from plots because flowering or fruiting.

TABLE 8

DATA ON THE EXCEEDINGLY RAPID GROWTH OF SOME RIBES ROEZLI PLANTS ON THE PETERSON MILL SITE, MARKWOOD MEADOWS, SIERRA NATIONAL FOREST, CALIFORNIA, MEASURED SEPTEMBER 8, 1939

Bush Number	Linear Feet of Live Stem by Years of Origin		Total Live Stem (Feet)	Growth Ratio $\frac{1939}{1938}$
	1939	1938		
1	17.8	0.9	18.7	19.8
2	24.2	0.4	24.6	60.5
3	24.7	0.7	25.4	35.3
4	29.2	2.5	31.7	11.7
5	32.7	0.8	33.5	40.8
6	38.4	1.8	40.2	21.3
7	44.5	0.8	45.3	55.6
8	53.0	1.3	54.3	40.8
9	70.0	4.7	74.7	14.9
10	75.0	9.3	84.3	8.1
11	112.3	7.3	119.6	15.4
12	158.8	3.8	162.6	41.6
Average	56.7	2.9	59.6	30.5

TABLE 9

RECORD OF STAKED BUSHES ON COW CREEK SPOT BURN PLOT

Date of Check	Number of Staked Bushes in Size Classes (Inches of Live Stem) as Shown					Total Bushes
	Number Live Stem (Dead)	1"-4"	5"-11"	12"-35"	36"-71"	
6/20/39	-	31	31	5	1	68
8/21/39	4	40	22	1	1	68

TABLE 10

SUMMARY OF THE SIZE OF SEEDLING-ORIGIN RIBES ROEZLI PLANTS FOUND ON 28 MILACRES OF COW CREEK BURN PLOT (C.F.E.S., MC #12)

Date of Check	Number of Seedling-Origin R. roezli Plants in Size Classes (Inches of Live Stem) as Shown							Total Plants
	1"-2"	3"-4"	5"-8"	9"-11"	12"-35"	36"-71"	72"-143"	
6/17/39	63	47	32	5	3	1	-	151
8/15/39	31	46	37	7	8	-	1	130

TABLE 11

SUMMARY OF VIGOROUS SEEDLING-ORIGIN RIBES PLANTS BEING STUDIED ON 5.6-ACRE COW CREEK PLOT (C.F.E.S., MC #12)

Year Staked	Bush Origin Year	Date of Inspection	Number of Seedling-Origin R. roezli Plants in Size Classes (Inches of Live Stem) as Shown								Total Plants
			Dead	0"-4"	5"-11"	12"-35"	36"-71"	72"-143"	12'-24'	25' +	
1937	1937	8/30/37	-	50	20	4	-	-	-	-	74
		7/2/38	5	6	29	23	9	1	1	-	74
		8/15/39	5	-	10	32	18	3	4	2	74
1938	1937	7/2/38	-	50	42	9	-	-	-	-	101
		8/15/39	4	24	34	31	7	1	-	-	101
1939	1937	8/15/39	-	5	42	36	5	2	-	-	89
	1938	8/15/39	-	11	20	7	-	-	-	-	38
	1939	8/15/39	-	1	5	-	-	-	-	-	6

TABLE 12

INCREASE IN SIZE OF GROUPS OF RIBES ROEZLI SEEDLINGS ON BURNED AREA OF 5.6-ACRE COW CREEK PLOT

Date Staked	Date of Inspection	Size Class of Plants When Staked	Number of Seedling-Origin R. roezli Plants in Size Classes (Inches in Live Stem) as Shown								Total Plants
			Dead	0"-4"	5"-11"	12"-35"	36"-71"	72"-143"	12'-24'	25' +	
8/30/37	7/2/38	0"-4"	3	6	28	11	2	-	-	-	50
		5"-11"	2	-	1	11	6	-	-	-	20
		12"-35"	-	-	-	1	1	1	-	-	4
	8/15/39	0"-4"	3	-	10	27	8	-	2	-	50
		5"-11"	2	-	-	4	10	2	2	-	20
		12"-35"	-	-	-	1	-	1	-	2	4
7/2/38	8/15/39	0"-4"	3	19	22	6	-	-	-	-	50
		5"-11"	1	3	12	23	3	-	-	-	42
		12"-35"	-	1	1	2	4	-	1	-	9

TABLE 13

VIGOR OF RIBES PLANTS ON COW CREEK 10-ACRE REGENERATION PLOT

Item		Dates of Inspection of Plot 7/10/38	8/11/39
Estimated vigor of fruiting bushes	E [1]	2	1
	G	24	9
	F	26	15
	P	6	2
	VP	0	1
Estimated vigor of non-fruiting bushes	E	0	0
	G	0	4
	F	36	29
	P	24	34
	VP	5	27
Total fruiting bushes		58	28
Total non-fruiting bushes		65	94
Total known bushes		123	122 [2]

[1] E = excellent, G = good, F = fair, P = poor, and VP = very poor.

[2] One dead bush was found in 1939.

TABLE 14

SUMMARY OF 1939 DATA COLLECTED FROM ONE-ACRE RIBES REGENERATION PLOTS

Plot	Date of Check	Size Distribution of Plotted Bushes							Total Bushes	Additional Known Seedlings	Estimated Live Stem on Plot (Linear Feet)		
		0"-4"	5"-11"	12"-35"	36"-71"	72"-143"	12'-24'	25' +			CSS[1]	Older	Total
Shaver Timber	9/6/39	5	4	-	1	-	-	-	12	-	3	4	7
Pilot Peak	7/10/39	7	45	69	23	6	1	-	151	110	132	166	298
Signal Peak	7/7/39	13	47	95	47	23	12	1	238	1,185	288	511	799
Signal Peak	9/14/39	15	22	33	12	7	2	-	91	25	94	131	225

[1] CSS = current season live stem

PART V - Section 3

THE ERADICATION OF UPLAND RIBES BY POWER METHODS

By

H. R. Offord, Pathologist, J. F. Breakey, Assistant Pathologist,
and L. P. Winslow, Agent

INTRODUCTION

During the 1939 field season practicable methods were developed and used for the first time for the eradication of upland Ribes by power equipment.

In the Sugar Pine Region of California and Oregon, Ribes roezli and R. cereum are sometimes sufficiently large and numerous over limited areas of ground to constitute all or most of the vegetative cover. Fortunately these conditions are the exception rather than the rule, but when they do exist, they offer substantial difficulty to Ribes eradication crews using the regular methods of grubbing. In the case of R. roezli, these troublesome areas are often old logging camp sites, leading decks, or abandoned railroad grades, all of which are comparatively accessible to power equipment.

The success already attained with the track-laying type of tractor for the permanent suppression of Ribes and brush in stream bottom areas suggested that a smaller and more mobile version of the stream type bull-dozer could be effectively used for the eradication of heavy concentrations of upland Ribes.

Through arrangements completed by Benton Howard, a 35-Cletrac bulldozer equipped with a special brush rake was tested near Butt Lake, Plumas National Forest, for the eradication of R. roezli. During the period May 30 to June 2, the operation of this machine under upland conditions was studied by the writers in collaboration with C. R. Quick, Benton Howard, and Ralph James. These preliminary trials were so encouraging that plans were made to go ahead with the construction of a small, mobile power unit for work in upland areas. Upon investigation of available equipment it was decided that the D-2 Caterpillar tractor equipped with a front-end Ribes rake, a hydraulic lift, and a rear end single drum logging winch, would constitute a practicable unit for the job under consideration.

Construction of the Brush Rake and Hooks

An informal agreement between the Bureau of Entomology and Plant Quarantine and Region V of the Forest Service, permitted the unit just described to be assembled and assigned to Ribes eradication work. These arrangements were made possible by the interest and assistance of T. D. Woodbury and C. E. Dunston of Timber Management, Anthony Dean of Engineering and Paul Brown of Operations.

The unit as purchased by the Forest Service consisted of a D-2 Caterpillar tractor, a LaPlante-Choate hydraulic lift, and a Willamette Hyster single drum logging winch. The necessary power take-off for the front end hydraulic lift and for the rear end winch were installed by the manufacturers.

At San Francisco during the period August 10 to 20, J. F. Breakey of this Bureau, and E. A. Meldrum from the Engineering Office of the Forest Service, designed a special Ribes rake to fit the D-2 Caterpillar and the LaPlante-Choate hydraulic lift. Under the immediate supervision of J. F. Breakey, the Ribes brush rake and the Ribes hooks were constructed at the Stockton shops of the Forest Service.

Detailed shop drawings of the Ribes rake and the 5- and 6-toothed Ribes hooks are on file at Berkeley. In this report, the 5-toothed hook is illustrated in Figure 1 and the Ribes rake in Plates I and II.

The steel needed to build the Ribes rake cost $219.29 and the labor to assemble and weld it amounted to $112.87, making a total cost of $332.16.

For building the two special Ribes hooks used from the rear end winch and for furnishing each hook with the necessary cable and clevises, a total of $32.07 was spent. Each hook required about six hours of a welder's time to assemble it. The teeth and frame had previously been cut by a machine torch to dimension and shape by the steel vendor.

A steel snatch block, 6-inch size ($7.00), 50 feet of quarter inch steel cable ($4.00), a choker hook and ferrule ($8.08), and about 400 feet of half inch steel cable comprised the accessories needed to operate the special Ribes hooks from the hoister drum assembly. The Ribes hooks weighed about 35 pounds each.

The writers wish to acknowledge the helpful cooperation provided by Mr. Hawkins and his assistants at the Stockton shops of the Forest Service. A highly satisfactory job of welding on the brush rake and hooks was turned out in a comparatively short time, and the quality of the work was attested by the rigorous field work subsequently undertaken with the equipment.

Preliminary Field Trials

Field trials of the assembled unit were started near Bretz Mill in the vicinity of Shaver Lake, Sierra National Forest, on September 15. During subsequent field trials in this area, D. R. Miller, Bureau Supervisor of blister rust operations on the Sierra National Forest, contributed many valuable suggestions on the equipment and crew methods that were developed during the course of the methods work.

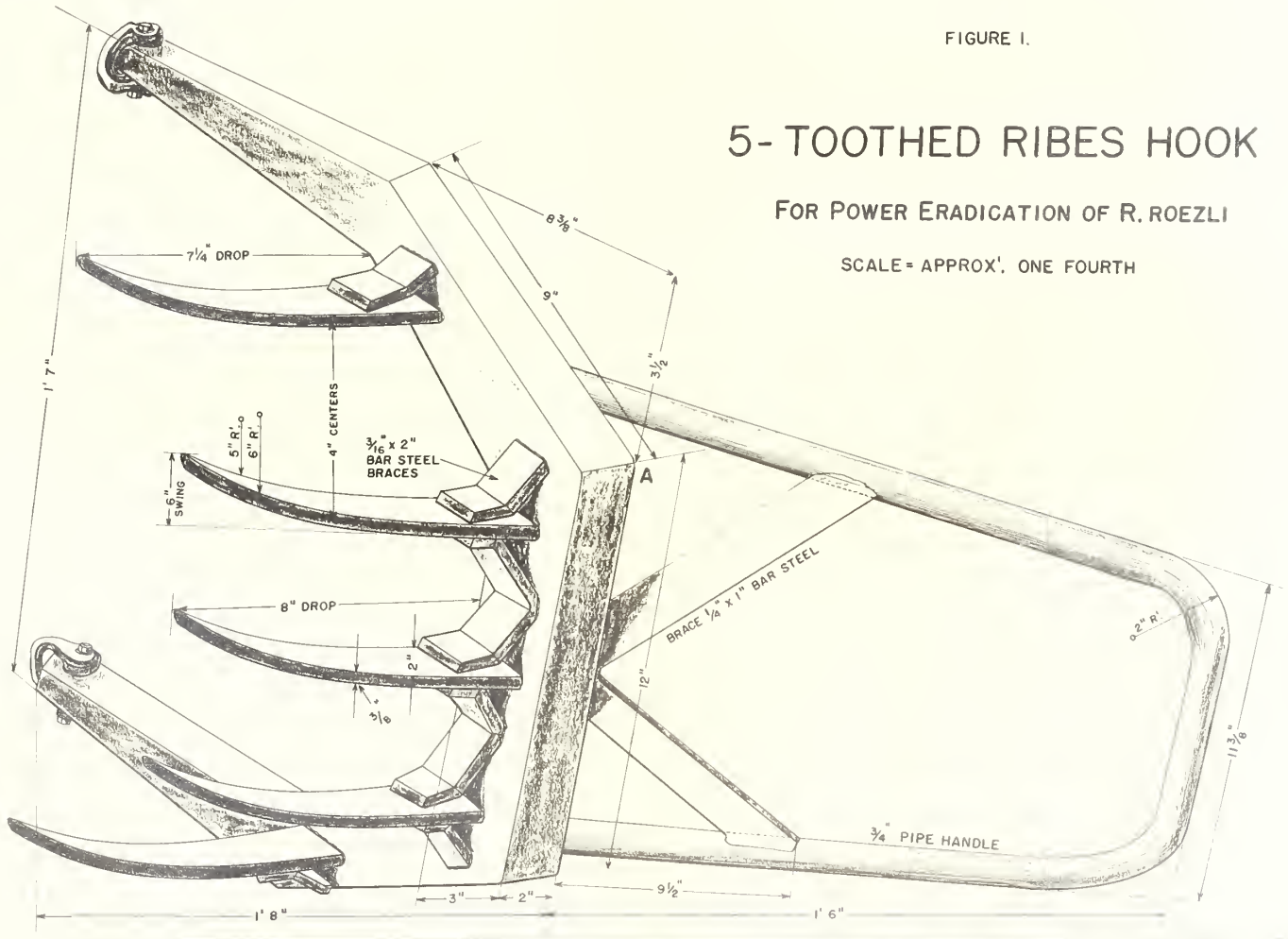
The area selected for the trial had been logged at least 15 years previously and supported a crop of R. roezli which averaged between 3,000 and 6,000 per acre. Most of the Ribes occurred in openings of the brush and trees. Coniferous reproduction was reasonably abundant and in some places Ribes and small trees were closely intermingled.

FIGURE I.

5-TOOTHED RIBES HOOK

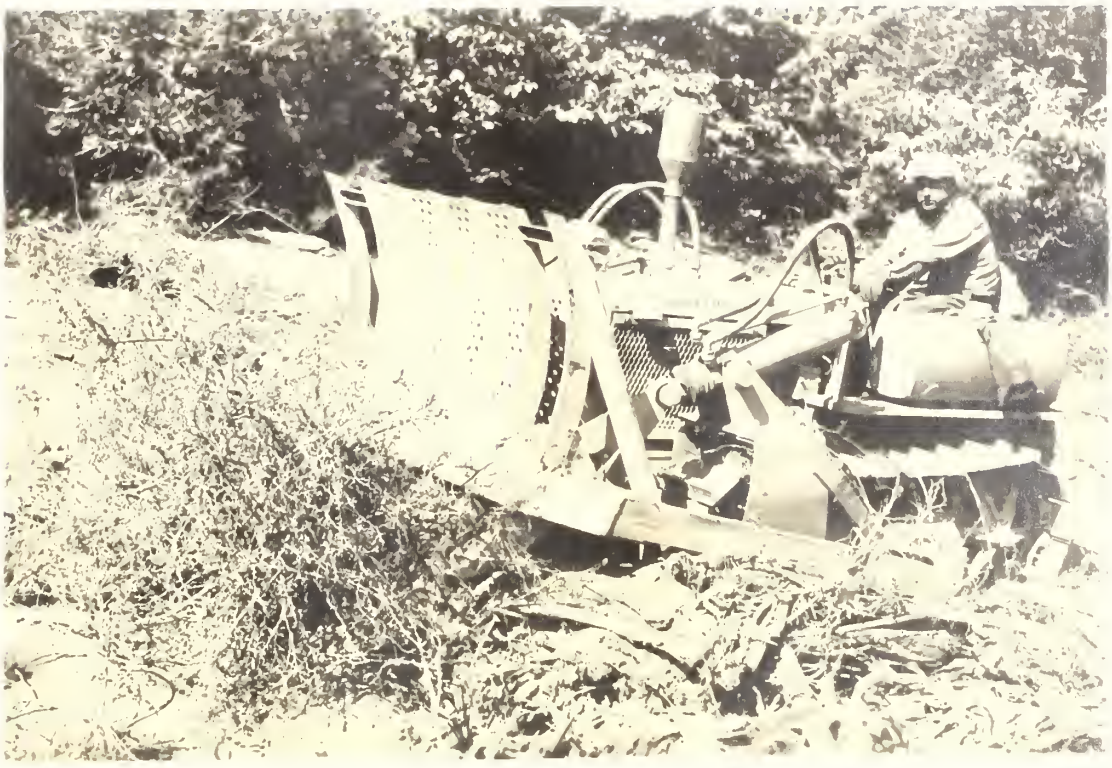
FOR POWER ERADICATION OF R. ROEZLI

SCALE = APPROX'. ONE FOURTH



DESIGNED BY J.F.B. 5-[illegible]-39
DRAWN BY L.P.W. & H.E.J.
OAKLAND, CALIFORNIA [illegible]

Plate I



Coterpillor Diesel tractor, D-2, equipped with Laplante-Choate hoist and speciolly designed ribes rake being used "dozer" fashion to remove large R roezli from logged-off lond Sierra Notional Forest, Colifornio, 1939.



Troctor showing Willomette Hyster winch mounted on reor being used to pull ribes hooks for erodicotion of R roezli Sierra Notionol Forest, Colifornio, 1939.

The trial was conducted in a manner which would give information concerning (1) proper technique for using front end Ribes rake, (2) conditions under which the front end rake could be used, (3) proper technique for using rear end Ribes hook, and (4) comparison of the rake and hook methods.

Method of Operating the Front End Ribes Rake

The method of using the front end Ribes rake as shown in Plate I is to scoop out the Ribes bush with a minimum of soil disturbance and to avoid, as much as possible, moving dirt along with the uprooted bushes. Briefly, the operating technique is to advance toward the Ribes bush with the tractor in low gear and the hoist in high gear. The rake is lowered so that the cross-member near the ends of the rake teeth will engage the brush just below the crown, usually from three to five inches beneatn the surface of the ground. As the machine moves forward and uproots the bush, the rake is raised slowly to clear the bush roots of clinging soil. When large clumps of Ribes are uprooted it is usally necessary to back up after the uprooting operation is completed. With single Ribes, or small clumps, the forward motion is continued and the next bush engaged, allowing the previous bush to fall away from the rake or be entangled with the new one. The machine has a slight nose-heavy action when the rake is being used, making it necessary for the operator to allow for a sharp increase in the angle of digging. This action becomes important when a large clump of Ribes is engaged, and is counteracted by lifting the hoist slightly in advance of the hard part of the pull.

When reproduction is uniformly distributed over the ground, it is difficult to maneuver the machine and root out the Ribes without destroying some of the young trees. Small incense cedar and R. roezli sometimes grow with their roots intermingled. In the majority of such cases, hand work is necessary to avoid destroying or damaging the tree.

The machine works best on level ground but effective work is possible either along a contour or up and down hill. Ribes in brush can be rooted out but the 25 horse-power unit used in the present tests was inadequate for effective use as a brush stripper in the extensive patches of Ceanothus cordulatus found on the Sierra National Forest. Where the Ceanothus grows in isolated clumps, the D-2 tractor can effectively eradicate the associated Ribes. The rake is especially valuable for rolling logs and uprooting Ribes growing around rotten stumps; such operations normally require an excessive amount of hand work.

Method of Using Ribes Hooks from Rear End Winch

An illustration of the specially designed Ribes power hook is given in Figure 1.

A 6-foot bridle of quarter-inch steel cable is attached to the two arms of the hook. The lead end of the bridle is then attached to the end of the pull line or cable from the winch by means of a hook or small clevis. A snatch block or sheave is hung on a convenient tree and the tractor is spotted from twenty to thirty feet from the tree in a manner which will allow the line to spool properly on the drum while running through the sheave. With the use of the sheave it is possible to work an area of ground roughly equivalent to a half circle without having to swing the rear end of the tractor.

The hook is set behind the crown of the Ribes bush (Plate II) and enough of the operator's weight is applied to insure setting the teeth of the hook firmly into the ground. At a signal from a ground pilot, the main cable is spooled in just enough to break the Ribes roots clear of the ground. As a rule, the Ribes bush is pulled out cleanly, the roots breaking off well-down in the ground (Plate III). Two men work together with the hook, one handling the hook and the other freeing and tossing aside the pulled bush, helping haul back the line for another pull, and giving signals to the operator of the tractor. Whenever practicable, work should be done so that the pull is up hill because a more effective grab can be made on the Ribes, and it is easier for the hook-man to carry or drag the hook down hill to the next bush. It is more economical to move the tractor than to work the hook at extreme distances because: (1) the tractor operator should have a clear view of the work, (2) the work progresses faster on short pulls, i.e., there is less slack in the cable to be taken up each time a pull is made, and (3) several hundred feet of line is more than two or three men can handle easily.

Care must be taken when working around trees or rock to see that the hook does not catch on solidly anchored material. Some breakage was experienced while pulling Ribes growing under trees and adjacent to large rocks.

Two hooks, each having 20 feet of cable attached to the main line were tried, but it was found by actual tally register counts that more work could be done with a single hook largely because of the patchy distribution of Ribes. Unless the cables on both hooks could be kept tight and at equal distances from the main line too much slack had to be taken up in the cable each time a pull was made. Plate II shows two hooks being used side by side to remove a multiple-rooted clump of R. roezli: Plate II also shows the entire ground crew and dozer operator at work.

To a limited extent, the hook can be used to pull Ribes in brush, and to move small logs and poles; however, when large logs and stumps need moving, the grapple should be replaced by a heavy single-pointed steel hook or light logging choker.

Plate 11



Ribes hooks, snotch block ond cobles hung on bulldozer roke. Equipment is reody for move to new locotion.



5-ond 6-toothed ribes hooks for pulling R. roezli. Used with cable from power drum mounted on reor of tractor.



Synchronized use of two hooks for cleoring a lorge potch of R. roezli.



Two ribes hooks in use on lorge clump of R. roezli. Note tractor in rear with coble running to snotch block.

Plate III



Five-toothed ribes hook in use on R. roezli. Details of hook shown on page 157 Note coble, left center, running to power drum on troctor. Sierra N. F., Colif., 1939



Horse-drown, 4-tooth plow-type hook in use on R. roezli. Details of hook ~~shown~~ given on page 118 Note extensive root system of ribes bush in foreground. Sierra N. F., Colif., 1939.

Since the cable is pulled out by hand, tension on the drum must be at a minimum. The cable is wound loosely about the drum as the slack line is taken up with each pull. This results in rapid wear and considerable pinching of the strands on hard pulls. Such wear cannot be eliminated as a slack line is necessary with hand work and frequent replacement of the main cable may be needed.

Cost of Operation

Rental on the machine, cost of fuel and grease, and wages of the operator are equivalent to 3 man-days of regular hand labor. The actual cost of renting the machine was $1.00 per hour. With a ground crew of two or three men for operating the hooks, the total overall cost of operating the unit (with the front end rake being used just intermittently for moving a log or other ground debris) is equivalent to 5 to 7 man-days of regular hand labor. With the rear end hook method, the unit can cover from one to three acres or more per 8-hour day, depending on Ribes density and ground conditions.

Use of the front end rake will demand a one-man ground crew to act as pilot for the tractor operator. Cost of operating the front end rake (fuel + operator + ground pilot) is equivalent to 5 man-days, but ordinarily this method is faster than the rear end hook.

Methods tests with the small tractor undertaken during the 1939 field season were concerned directly with trials of the equipment itself and with the development and testing of technique for the training and deployment of ground crews. No tests were made to provide a direct comparison of regular hand methods with the machine. Furthermore, records are not available from the regular eradication work on the cost of removing solid patches of Ribes of the type worked by the bulldozer. It is estimated, however, that machine work will be 25 percent to 50 percent cheaper than hand work for most areas of troublesome Ribes. If the power equipment can be made available next year for methods work, some direct time studies will be made on hand and power methods.

For the present the opinions of experienced blister rust personnel must be taken as an index of the practicability of the machine method. Observers of the Shaver Lake and the Soquel CCC jobs, where the unit was used in areas of exceptionally heavy Ribes for about two months, concluded that the power method was much faster and more effective than hand labor in areas where the Ribes were large and numerous. Also, it was generally agreed that the morale of workers was tremendously favored by employing hand labor in the light going instead of assigning them to the heavy manual work in areas of high Ribes concentrations where their accomplishments appear discouragingly small. By blocking out the troublesome areas and reserving them for power equipment, the camp can be trained and continuously geared to faster methods of covering ground.

During the period September 16 to October 18, the following data on the operation of the machine were taken in the course of methods tests undertaken in the Shaver Lake area:

Machine hours (by motor meter) 98

Field hours for machine (with crew in attendance) 138-1/2

Total gallons of Diesel fuel used 120	
Total gallons gasoline used for starting motor	4
Total gallons oil	9-1/4
Pounds grease	7

Total 8-hour man days of operating crew 70-3/4

Total more or less solid acreage of Ribes worked 23

Total acreage claimable 40

Estimated total number of Ribes crowns (from data on hourly grabs of hooks).....75,000

Actual number of grabs by rear end hooks (tally register count)..... ..23,669

Average grabs per hour with one hook 212.2

Average grabs per hour with two hooks 197.3

Total hours rooting by front end rake 25

Total hours pulling by rear end hooks 113-1/2

Average operating cost in man days (tractor and operator counted as 3 man days) 5-7

The front end rake is most effectively used and perhaps should only be used where Ribes are dense and coniferous reproduction is scattered or absent. The rear end hooks may be used under all conditions but most effectively where the Ribes are more or less clearly defined as separate bushes and where there is not too much ground debris to be moved. The hook method is not as effective as the front end rake for Ribes concealed and protected by a clump of brush such as Ceanothus. The two methods may be compared as follows:

	Advantages	Disadvantages
Front end rake:	Faster Cheaper Requires smaller crew	More soil disturbance May destroy small trees
Rear end grapple:	Less soil disturbance Destroys fewer smaller trees More mobile Can work steeper slopes	Slower More costly Requires good men

Power methods, essentially the small bulldozer equipped as herein described, are recommended for the eradication of R. roezli whenever the cost of hand work exceeds 6 man-days per acre. Athough it is advantageous to have the dozer furnished with the front end rake, an effective eradication unit can be put into the field by outfitting any tractor (which carries a rear end winch) with the necessary cable and Ribes hooks. Since the tractor equipped with the rear end winch is now employed on many forests as standby fire equipment, the present methods development should conform nicely with multiple use planning for equipment.

Recommendations for Future Work

(1) Determination of the costs per acre for the eradication of various concentrations of Ribes by means of the front end rake and by the rear end hook. (2) Design and construction of a hook with replaceable teeth to simplify field repairs. (3) Trial of front end rake on a larger tractor for use on Ribes in brush. (4) Determination of best types of hooks for use on different Ribes species, that is, R. roezli and R. cereum. (5) Study of seedling regeneration following different types of mechanical eradication. (6) Construction of an A-frame for hanging a swivel sheave on the rear of the tractor, thus eliminating the time wasted in the selection of and hanging of the block on a suitable tree. (7) Design and construction of a large multiple-toothed hook for use on the drawbar of tractors not equipped with the dozer-type hoist. (8) Testing of smaller tractors than D-2 or other cheap power plants for operating hooks.